

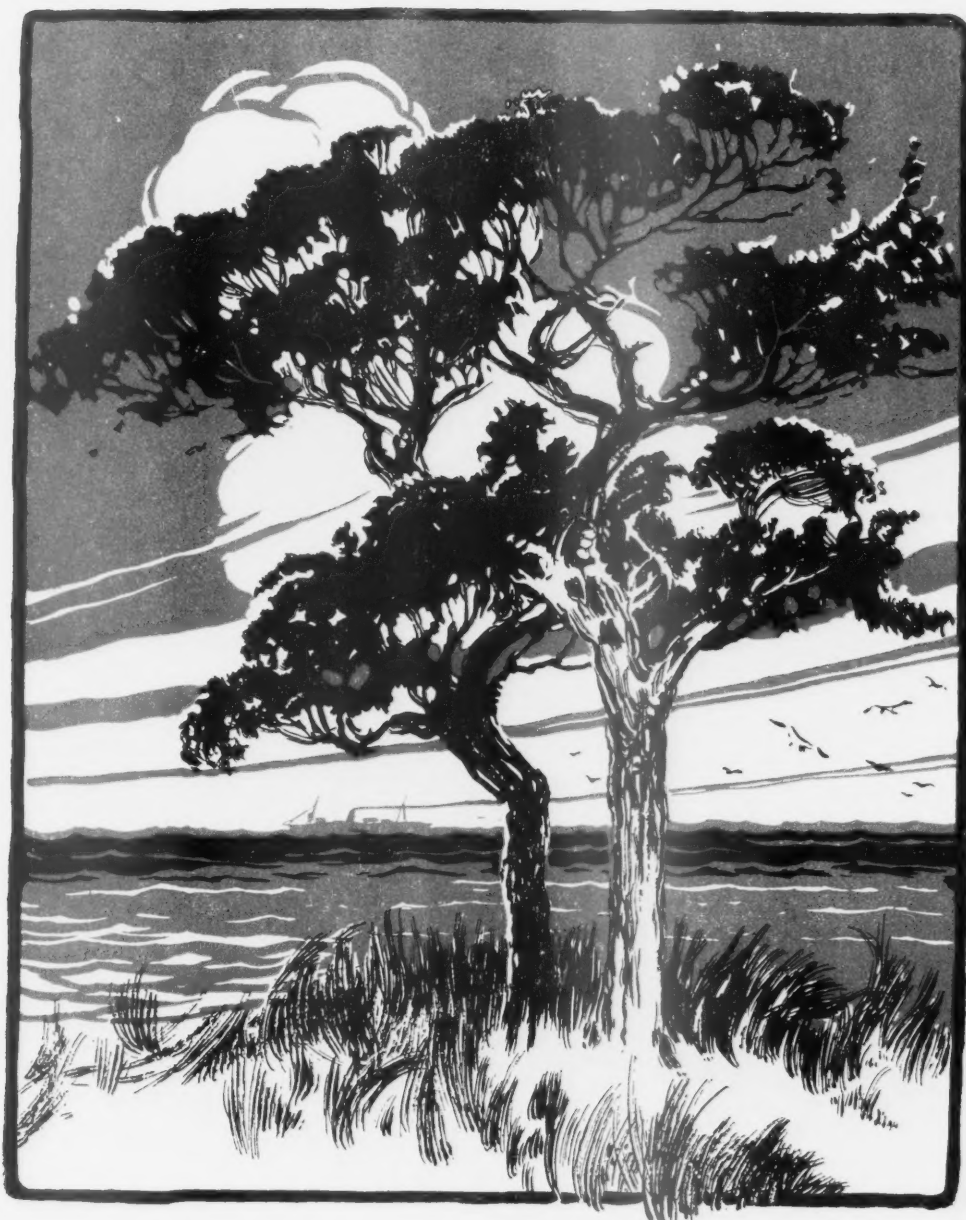
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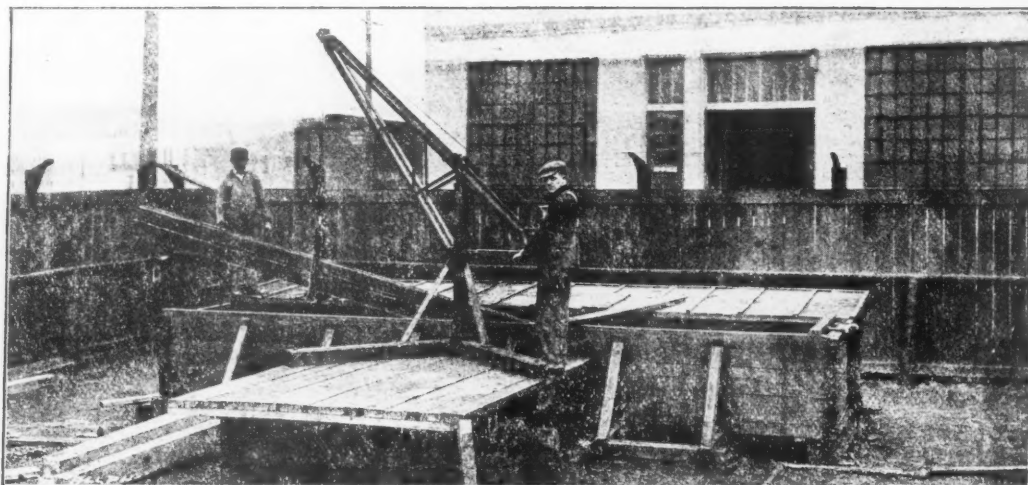
AUGUST, 1918

NUMBER 296

American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association, Washington, D. C.



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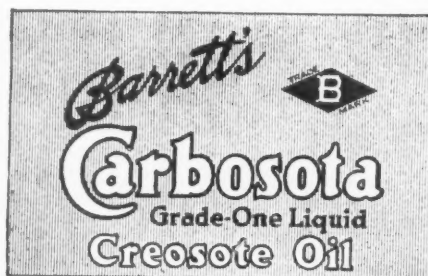
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AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

AUGUST 1918 VOL. 24

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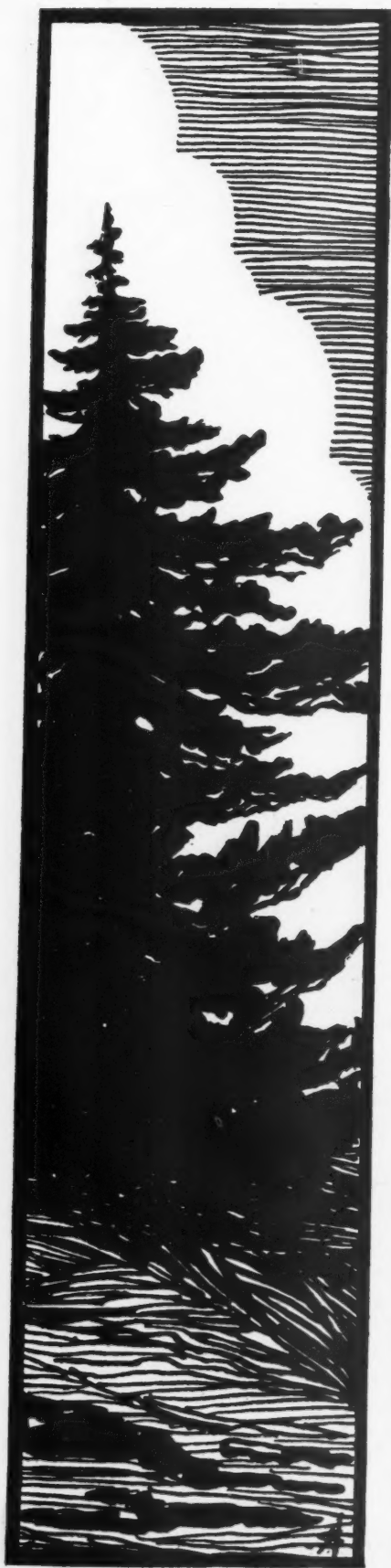


IN THE FLATHEAD NATIONAL FOREST.

The quiet beauty of this spot at the west end of Stanton Lake in Montana, makes strong appeal.
Heavy timber surrounds the lake.

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THE WHITE PINES

FOR many centuries the White Pines have shared their divided glory of sunshine and shade, of snow and rain, and the rise and set of sun. They have spread their breadth day and night in the mountain ranges and in the valley plains. The pine seeds that wrought miracles—that gave mankind all there is of perpetual and beneficial force—the fruitage that built homes for humanity 🌲 🌲

Are we giving the greatest prophecy to the future of the pines? Let us lead the younger race of pines over the leagues of idle lands, so that this great step shall cease the starved soils, and make the swaying forests the Mother of every industry and science 🌲 🌲

—Agnes L. Scott

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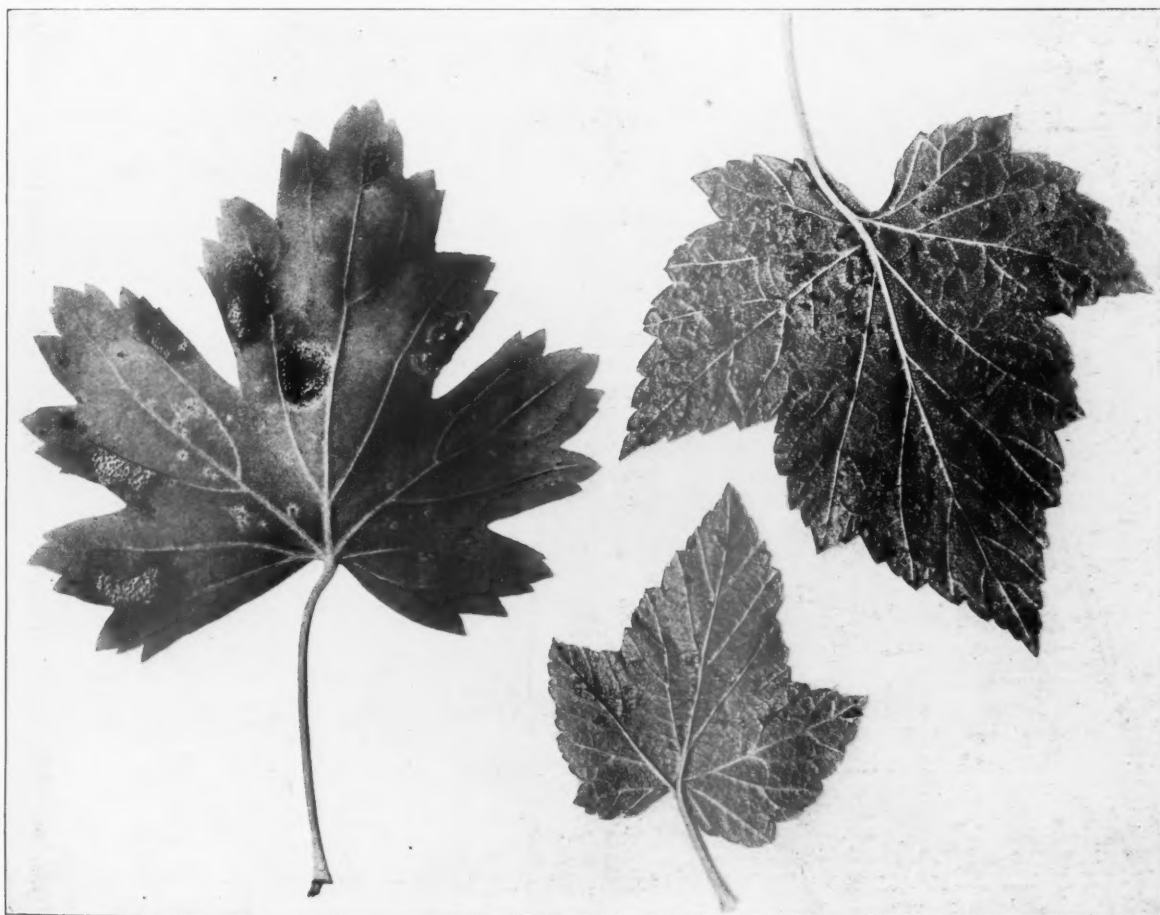
BATTLING THE PINE BLISTER RUST

BY S. B. DETWILER

THE blister rust battlefield stretches from coast to coast. Introduced into the United States from Germany and other European countries less than a score of years ago, this disease of our white pine trees is well established in the New England States and New York, is attempting to get a foothold in Minnesota and Wisconsin, and without constant vigilance, it will find its way into the sugar pine and white pine forests of the far West.

Fighting the blister rust is less spectacular than fighting the Germans, but it is almost as difficult and necessary. Enormous as are present demands on our timber

supplies, they will be greater in the future. The goal in the fight against the blister rust is the preservation of one of the noblest groups of trees native to American soil—the white pines. Not only are these trees of surpassing usefulness because of the exceptional qualities of the wood, but their comparatively quick growth and adaptability for planting and management make them especially valuable to the forester, who looks to the needs of the future. European experience with the blister rust indicates that its unrestricted spread in this country would be a catastrophe. The native white pine in the Eastern states is valued today at \$186,000,000. The



Courtesy of W. S. Carpenter, New York Conservation Commission

CURRENT LEAVES INFECTED WITH BLISTER RUST

The leaf with the deep rounded notches at the left in the picture is that of a flowering currant, the others are ordinary cultivated red currants. The dark spots (on the under sides of the leaves) are the fruiting bodies of the blister rust fungus. White Pine Blister Rust is caused by a fungus (a parasitic plant) which was brought from Europe on nursery stock. It begins life in the young bark of five-needled pines and produces blisters there that are filled with dust-like seeds called spores. The spores are blown in May and June to currant and gooseberry leaves and grow into a rust on the under sides of the leaves. After a period of growth on the leaves, another form of seed-like spores are developed and are blown in August and September to healthy pines. The life cycle then begins all over again. Spraying will not check its spread. The only preventive measures are the cutting and burning of diseased pines and the eradication of all currants and gooseberries in infected localities.



Courtesy of W. S. Carpenter, New York Conservation Commission

BLISTER RUST ATTACKS TREES OF ANY SIZE

Fourteen branches infected with blister rust were found on this tree, of which eleven are shown in the photograph. The tree is 35 feet tall, 8 inches in diameter at breast height. The largest branch girdled by the disease is $3\frac{1}{2}$ inches in diameter at the point attacked. The currant which apparently caused the infection on this tree grew about 300 feet distant.

acreage of young native pine is about twice as great as that of the timber fit for the saw, and lumbermen and land owners estimate it as being equal in value to the merchantable pine, making the total pine value in this comparatively small area approximately \$1,300,000.

The possible loss from this disease in the West is even greater. Mature sugar pine and western white pine timber is valued at \$240,000,000. Both of these pines have been attacked by the rust in Europe and, together with the limber pine of the Rocky Mountains, would provide a means for disseminating the disease over the entire country west of the Great Plains. Up to the present time, however, the disease has not advanced so far, and it is hoped that rigid enforcement of the Federal quarantine against shipment into this region of five needled pines, and of currant and gooseberry nursery stock,

will keep the disease out of the western forests. One striking peculiarity distinguishes this disease of the white pines from most other fungus enemies of trees. It cannot

be communicated directly from one tree to another, but must pass two stages of its life on currant or gooseberry leaves before it can attack the pines. It lives

on currants and gooseberries of all kinds — "spice" or ornamental currants, red, white and black currants, cultivated and wild — and gooseberries of every description. On the pines, however, it is harmful only to those with needles in groups of five — the white pines. To save the pines all that is necessary is to destroy the currant and gooseberry bushes in the vicinity of the trees. This is accomplished without great difficulty where there are only cultivated currants and gooseberries, but where there are wild gooseberries and currants, as there are in most localities where white pine is native, it is often a serious problem. It is important to uproot all of the currants and gooseberries before the disease reaches



Courtesy of W. S. Carpenter, New York Conservation Commission

THE BEGINNING OF THE BLISTER RUST

The dead branch at the left first became infected, and the disease continued on into the trunk, near the base of the tree. This photograph was taken at Kittery Point, Maine, during the month of May, 1918. Hundreds of young native white pines in this area are similarly attacked.

the latter if possible, or at least very soon afterwards. Otherwise the pines may become diseased without showing any outward evidence of the fact for a long time.

The blister rust is not an insect as many suppose, but a fungus; that is, a plant which has no leaves and feeds on the live tissues of other plants. When a white pine tree is attacked, the invisible "roots" or mycelium of the blister rust fungus start to grow into the base of the pine needles soon after the spores are blown to them from currant or gooseberry leaves. The disease continues to spread from the needles to the twig below, then into the branch and finally the trunk of the tree. After an indefinite number of years, but usually two to three, the spore bearing sacks push through the pine bark. These sacks are bright orange in color, about the size of a grain of corn, and give the pine bark a blistered appearance, hence its common name. Eventually, the tree dies.

The spores formed in the blisters germinate and grow when they fall on a currant or gooseberry leaf. About ten days later little yellow or rusty brown spots appear on the under surface of the leaf. Late in the summer the currant or gooseberry leaves frequently become so completely covered with these spots that the entire lower side of the leaf has a rusty aspect. During the summer and fall, dark brown horn-like growths, not much larger than a pin point, also develop on the under side of the leaves. These "horns" bear the spores that cause the disease on white pine trees.

Very rarely, the blisters break out on pine twigs a year after they are infected. At other times it takes many years for the disease to become visible. In one instance, trees infected with the blister rust at the time they were brought into this country from Germany in 1902 apparently first produced "blisters" this spring—a period of sixteen years for development. Eighteen years is the longest time on record for the period between the time the disease entered the tree and the first appearance of the "blisters."

Aside from the peculiarity of this disease in attacking the pines only through the medium of currants and gooseberries, the most important point bearing on its control is the distance to which the spores are carried from currants or gooseberries back to the pines. Information on this point is furnished by a careful study of an area of infected native white pines in one of the New England states. This study was made recently by Mr. George A. Root and Mr. H. E. Grupe. The topography of the area is rolling, flattening out into an open river-valley on the north. The low hills are covered with dense stands of almost pure native white pine. Between these stands are open fields and pastures, with here and there scattered pines. All of the pines were carefully examined within a radius of one and one-half miles of the infected area.

The infection was traced to cultivated currants which grew in a garden at the eastern edge of the infected pine area, and which were heavily diseased with blister rust when destroyed in 1917. The individual pine infections seemed to date back to 1912-13. The original source of the infection is not known, but it is possible that it was brought in on the currant bushes from the nursery

where they were purchased. Within a radius of 500 feet of these bushes there were 1360 pine trees, of which 43 out of each thousand were infected. In a zone 500 feet wide outside of the central circle, there were 7840 white pines, of which 33 trees out of each thousand were attacked by the rust. In a 500-foot zone around the second circle (that is in the zone lying between radii of 1000 feet and 1500 feet from the diseased currants), there were 14,710 pine trees, and only 4 trees out of each thousand were infected, or less than one tenth as many as at the center of the area.

The disease progressed westward and slightly south from the currant bushes, following the prevailing winds. Pines growing in the open and along the borders of the woods were most severely affected. Beyond this, to the west, three diseased trees were found, slightly less than 1800 feet from the infected currants at the center of the area. However, as these were close to other cultivated currants, known to be diseased in 1917, it was concluded that these infections probably were not part of the larger infection area.

Trees of all ages and sizes were attacked by the blister rust, without discrimination. In each 100 infected pines, 36 trees were 1 to 12 years old, 45 trees were 13 to 24 years old, and 19 trees were 25 years old and upward. More than half of the youngest age group (1-12 years) were diseased on the trunk, while of trees 13 to 24 years less than one-tenth had the trunk attacked. The trees above 25 years of age had no disease on the trunks, but only on the branches. This does not mean that the trunks of the larger trees will not become diseased, but only that sufficient time has not elapsed for the disease to have run its course. Usually it requires a number of years for the fungus to work its way down the branches of a large pine, girdle the trunk and kill the tree. Small trees succumb to the disease more quickly and even these may live 3 to 6 or more years after the disease is apparent on the branches. But however slowly the disease progresses, death is none the less certain. It is especially important, however, to protect young pines by the removal of currant and gooseberry plants, because a tree 25 years old, though attacked, may live long enough to produce a saw log, but a tree 5 or 10 years old will die from the blister rust long before it becomes merchantable.

Within a radius of 4 to 12 miles of the original infection area just described, there were about 20 secondary pine infection centers. All of these were near cultivated currants and gooseberries, and most of them were small twigs on a few trees, indicating recent attack. The most probable explanation is that the diseased pines in the oldest infection area produced spores in great quantities, infecting nearby currants and gooseberries. As the disease can pass directly from one currant or gooseberry bush to others, the disease thus advanced from the nearby currants to the currants in the surrounding country.

White pine blister rust work in the New England States and in the Champlain Valley in New York is



Courtesy of W. S. Carpenter, New York Conservation Commission

A SEVERE INFECTION

The base of this native white pine tree is completely girdled by the blister rust fungus, and death will result very shortly. This photograph shows plainly the characteristics by which the disease may be recognized on pine in the spring. According to Mr. Carpenter, the title of this picture should be "Blister rust is beautiful and terrible!"

confined principally to the development of control areas. These areas are especially selected where young native white pine growth is of high value, and the effort is being made to free them from currants and gooseberries of all kinds, thus saving the pines not already diseased. Many new pine infection centers have been found in these states during the past year, and immediate and drastic action is necessary in securing the removal of currants and gooseberries, or serious destruction of pines will result. In New Hampshire 43 towns have voted appropriations to co-operate with the State Forestry Commission and the United States Department of Agriculture in establishing local control areas. Local control in which each land-owner is interested, with the help of State and Federal funds, seems to offer the best solution of the blister rust problem.

It would be sufficiently difficult to control the disease if only cultivated currant and gooseberries were involved. The thrifty housewife mourns the loss of her currant jelly and gooseberry jam, and commercial currant plantations that represent a valuable source of income to their owners are not infrequent. However, most people in pine regions realize the greater value of the pines, and when they learn that they must choose between their currants and gooseberries and the trees, they sacrifice their bushes. It is hoped that some harmless substitute may be found to take the place of cultivated currants. Possibly high bush cranberry could serve this purpose, since its fruit makes excellent red jelly. It is a valuable ornamental shrub as well, although it lacks the fragrance of the "spice" currant, dear to the heart of New England because it announces the permanent advent of Spring.

In New England and north-eastern New York, wild currants and gooseberries are generally distributed. In some sections the bushes average only one or two per acre, in other places there are sometimes hundreds on an acre. In moist situations, skunk currants may form

a complete mat, covering the ground. Along stone walls and on dry or rocky hillsides, wild gooseberry bushes are numerous. One such bush was found last year that measured 14 feet in length, but usually they are 1 to 3 feet high. They are usually very firmly rooted, and well protected with prickles. In low, moist ground, wild black currants may be found occasionally, the bushes sometimes being as tall as a man and strongly rooted. It is not uncommon, also, to find cultivated bushes growing in the woods, where the seeds were carried by birds, or where they remain to mark an abandoned house site.

The general plan of control is to uproot all wild and cultivated currant and gooseberry bushes from the areas in which the pines are to be protected from the rust. A crew of five to seven men, under the direction of a foreman, goes back and forth over the territory, strip by strip. The men work from 6 to 20 feet apart, depending on the density of the brush, and every foot of ground is scanned for gooseberries and currants. When found, the bushes are pulled up and burned, or hung up where they will quickly die and have no possibility of further harm. If the crown or "whirlbone" of the bush, with its attached roots, is removed, the plant is destroyed. If the top of a gooseberry bush is merely broken off, or a portion of the crown remains, vigorous sprouts will soon renew the plant. For this reason, it is best for the crews to be equipped with small picks or light grub hoes, rather than to attempt to pull up the bushes by hand power alone. In the case of skunk currant,



Courtesy of W. S. Carpenter, New York Conservation Commission

THE ULTIMATE EFFECT OF BLISTER RUST

This photograph illustrates the statement that a tree infected with white pine blister rust never has been known to recover. The stem of this tree was girdled two feet above the base at the point where it is broken. The tree is a 15-year old native white pine, 3½ inches in diameter.

each little piece of the root stock that remains in the ground quickly sprouts and forms a new plant, like witch grass.

Pieces of tin about five inches square, dipped in bright red paint, serve well to mark the lines through the woods. A hole about one and one-half inches in diameter is made near one corner of the tin, and a number of markers are carried on a hook attached to the

belt of the man marking the line. They are hung on twigs or stubs of branches, and the same man follows the line on the way back, picking up the markers, while a new line is marked by another member of the crew. Thus no time is lost in looking for the line and no bushes are missed between strips.

In each of the New England states, and in New York, a special control area has been selected for demonstrating methods of eradicating currants and gooseberries and for securing cost data on various types of land, and under varying conditions. These areas will be gone over at intervals of one to three years, to determine how often it is necessary to cover a given territory in order to free it of the bushes. It is inevitable that occasionally a bush is broken off and becomes re-established; also there remain a number of small seedlings, which eventually develop into thrifty plants, but which are too small to be found by the crews. However, necessity has developed methods to control weeds, and there appears to be no good reason why wild currants and gooseberries should not be eliminated at reasonable cost. The results of the work so far give every indication that the cost of this work will be far less than the cost of replanting an area if its present stand of young pine were destroyed by the disease. This does not include the loss of time which replanting would occasion, nor the very considerable loss in money if fine stands of native pine, five to fifteen years old, were permitted to be destroyed before they reach merchantable size. Furthermore, replanting such areas with white pine would not be successful unless the currants and gooseberries first were destroyed.

As in other lines of work, practical experience will develop new methods and increased efficiency. The

recent announcement of the successful progress of citrus canker eradication in the South is gratifying, because it proves that effective disease control can be done on a large scale. In the case of blister rust there is no hope that the disease can be eradicated from the eastern forests, but effective control is another matter. There is no question that with currants and gooseberries absent, the disease cannot attack the pines. The work to date proves that on many areas, at least, the bushes can be found and destroyed. All known facts bear out the statement that the maximum distance to which it is necessary to remove currants and gooseberries to protect the pines from serious infection is not greater than a third of a mile. Any pine owner can apply this remedy to protect his own pines. It requires training to recognize the various kinds of wild currant and gooseberry bushes, and the work must be carefully done or bushes capable of damaging the pines will be missed. A little study will enable each owner to determine for himself if it is practicable to protect his trees.

West and south of New York State the blister rust situation remains about the same as in 1917. Scouting for the disease is being done on an extensive scale. No new infections are reported from Pennsylvania and New Jersey, and the disease has never been found in the states further south. In the Lake States, scouting is being carried on in the native woods. In two states, Minnesota and Wisconsin, the disease has spread to native pines from infected nursery stock. The disease is known at but three places, and is being eradicated as fast as found. Shipments of nursery stock into the far West are being traced, but no indications of infection have been discovered.

HELP THE TREES!

IF every man would be his own city forester and do his bit in taking care of the tree or trees on his own property, it would be a big lift in this time of labor shortage. On this subject the Washington *Evening Star* says:

"Another war service opportunity was presented to Washingtonians in an appeal by the District authorities to property owners to cultivate the young trees which have been planted along the sidewalks in front of their homes.

"Ordinarily about 100 men are employed by the department of trees and parkings for this purpose. On account of the labor shortage there are now but fifteen men engaged in the work. Home-owners are urged to come to the rescue, and it is pointed out that by so doing they not only will reap a benefit themselves but will assure the city of attractive, shady streets in the future.

"By loosening the soil around the young trees, removing suckers and otherwise employing cultivation methods, property owners, say the District authorities, will render an invaluable war service."

AMERICAN FORESTRY applauds this sentiment. The example set by the District should inspire the park and shade tree authorities in other cities to ask for similar co-operation from their people.

THE TIME TO CUT WALNUT

DR. Robert T. Morris, of New York City, a well-known authority, in a recent letter to AMERICAN FORESTRY, says:

"No doubt the United States Department of Agriculture has taken into consideration the proper time for cutting black walnut trees reported by the Boy Scouts. The matter, however, is one which concerns us so deeply that I may be allowed to impress the point that these trees so far as possible should be cut between the months of September and April. If the trees are cut at other times of the year the root dies. It is a very important matter to leave living roots which will reproduce the trees rapidly. It is not only a question of future timber supply but the nut growers are at the present time making special effort to locate black walnut trees bearing particularly thin-shelled and well flavored black walnuts with good cleavage.

"The black walnut is destined to play a large part in our agricultural economics, both as a timber tree and as a source of important food supply. For that reason special effort should be made to avoid summer cutting."

BARRACKS A. R. C.—AMERICAN RED CROSS

BY P. L. BUTTRICK, SECOND LIEUT., A. R. C.

WE are accustomed to think of an army in the field as an institution which lives mostly in tents or occasionally, when nothing much is happening, as when the Northern armies went into winter quarters along the potomac in our Civil War, in log huts banked with earth and roofed with canvas. In peace time when not on maneuvers an army is supposed to sleep in permanent stone barracks.

Most of our wars have been fought over rather wide stretches of thinly settled country where tents were about the only available means of shelter. In Europe a mental picture of an army in the field does not include long rows of tents, since Western Europe is so thickly settled that its armies have generally been housed, billeted in the regular military term, in small villages, troops being quartered in each house according to its capacity.

In all the tiny villages of the French war zone one sees today signs on each house stating how many soldiers may be quartered there. In the zone of operations of the American army these signs are in two languages so as to be understood by the officers of both armies.

In the present war, it was early discovered that owing to the large size of the armies involved it was impossible to lodge them all successfully in the villages behind the lines. It seemed, therefore, that the country back of the lines must soon be dotted with white, kahki, or horizon blue tents, which would—as time and material became available—gradually be floored over with rough boards and have their sides built up with rough lumber and logs reminiscent of the environs of Alexandria,

Virginia, in the winters of the Sixties. But this development has never taken place, partly due to the fact that it was early realized that most of these shelters would have to be semi-permanent and not often moved, partly because the moist European climate is not so favorable to tent life as our own, partly perhaps because canvas in the enormous quantities necessary was not available at once.

One sees tents in the war zones—lots of them—they are used for the temporary supply depots for housing

strictly mobile units and very largely for aeroplane hangars, but the main problem of shelter for troops behind the lines which cannot be housed in existing buildings has been solved in quite another fashion—by the use of large numbers of portable or semi-portable wooden buildings, *barraques demontables*, as they are called in French.

These are wooden structures built of panels supported on truss-

sed framework. They are built at sawmills or woodworking plants and easily assembled with the aid of a few nails at the point of erection. The French army uses several types of these barracks, some made from its own designs and some from designs of various engineering firms in France. Some are fitted with floors, double walls, ceilings and glass windows, others are simply single walled, floorless shacks with cheese cloth soaked in oil in place of glass in the windows. Generally they are made of pine or spruce—*pin et sapin de bon qualite*, reads the description—but like lots of other things much depends upon the interpretation of the word "bon." In the earlier days of the war the French sacri-



TYPICAL SCENE AT ONE OF THE CAMPS

An earnest worker of the Red Cross at one of the camps in France. In the background may be seen barracks of the standard type of construction.

ficed many of their wonderful road-side lombardy poplars to make barrack lumber, but they have largely stopped that now. The lombardy poplar is a strange looking tree—it has also a strange and wonderful wood. A barrack built of it in a few months assumes an appearance of being an acute sufferer from shell shock. It provides an abundance of unofficial points of ventilation. We say this feelingly, for, as Kipling says in one of his poems, "we can testify for we were there."

After erection, these barracks are roofed with tar paper, and sometimes the sides are also covered with it. Occasionally they are painted and near the Front they are sometimes camouflaged with all sorts of designs. The size varies from 3 x 4 to 8 x 40 Metres, but 6 x 30 (20 x 100 feet) is more or less of a standard for military barracks. Most of the different types have names, often those of the firm which designed or manufactured them. Thus we have HAMMON FRERES barracks, BES-SANOUE barracks, ADRIAN barracks, SWISS barracks—because they are made in Switzerland—and many others.

Not only are these barracks used in the war zone for housing troops; they serve individually or in groups for storehouses, field hospitals, canteens, barns, workshops—everything. Outside the war zone they are also used for housing soldiers, laborers, prisoners, refugees, and what not. Often they crop up in the most unexpected places. Once I crossed the drawbridge of a mediæval castle whose keep is used as a confinement place for boche prisoners who have tried to escape and found an Adrian barrack in the middle of the old courtyard—it housed the guard.

In addition to these standard types of barracks, the French are constructing large numbers of small portable wooden houses to replace the destroyed dwellings in the invaded districts.

When the American army came to France it quickly realized the impossibility of carrying on its activities entirely under canvas and in existing buildings and speedily began to purchase barracks and then more barracks. It was planned at first to bring over most of the

lumber for their construction from the United States, but it was soon evident that they could obtain them in sufficient—and that means in very large—number in France and Switzerland. So now at several points in France the United States army has barracks depots, out of which they can ship enough barracks to house an army corps as fast as they can get the railroad cars.

Not only the army itself, but that great auxiliary military service, the American Red Cross, which works with all the allied armies, but especially the French and American, found a need of portable barracks in large quantities. The Red Cross needed them in Belgium for civilian relief works, it needed them at French and American hospitals for recreation centers, it needed them in the American war zone for warehouses for special supplies furnished by the surgical service, it needed them for special hospitals not directly under the control of the army medical corps, it needed them for canteens along the lines of communications of the armies.

To handle this problem and also the numerous other problems of construction, such as turning hotels into hospitals and restaurants into offices, that the Red Cross is constantly called upon to perform, a special service called "Bureau of Construction" was organized. Like the Engineer corps of all armies, its function is to

do all the real work and for its reward to get all the kicks. It numbers in its forces some of the best known American architects.

Last summer (1917) when the plans of the A. R. C. took shape and the need of large numbers of temporary structures was recognized, the Construction Bureau let a few small contracts for existing types of barracks. This started the work. But the types of barracks already designed did not seem quite to meet the needs of the Red Cross. Most of its barracks once in place would remain so for the duration of the war—easy demontability was not therefore essential. It could easily, in fact, be a disadvantage as a strictly demontable building is often less tight and comfortable than a more permanent one. Generally the standard types of bar-



Underwood and Underwood—British Official Photograph

THE BRITISH PUTTING THEIR CAPTIVES TO GOOD USE

Wood being the essential war material, the Britishers are using their German prisoners in transferring cut wood to small railway trolleys to be sent to construction units.

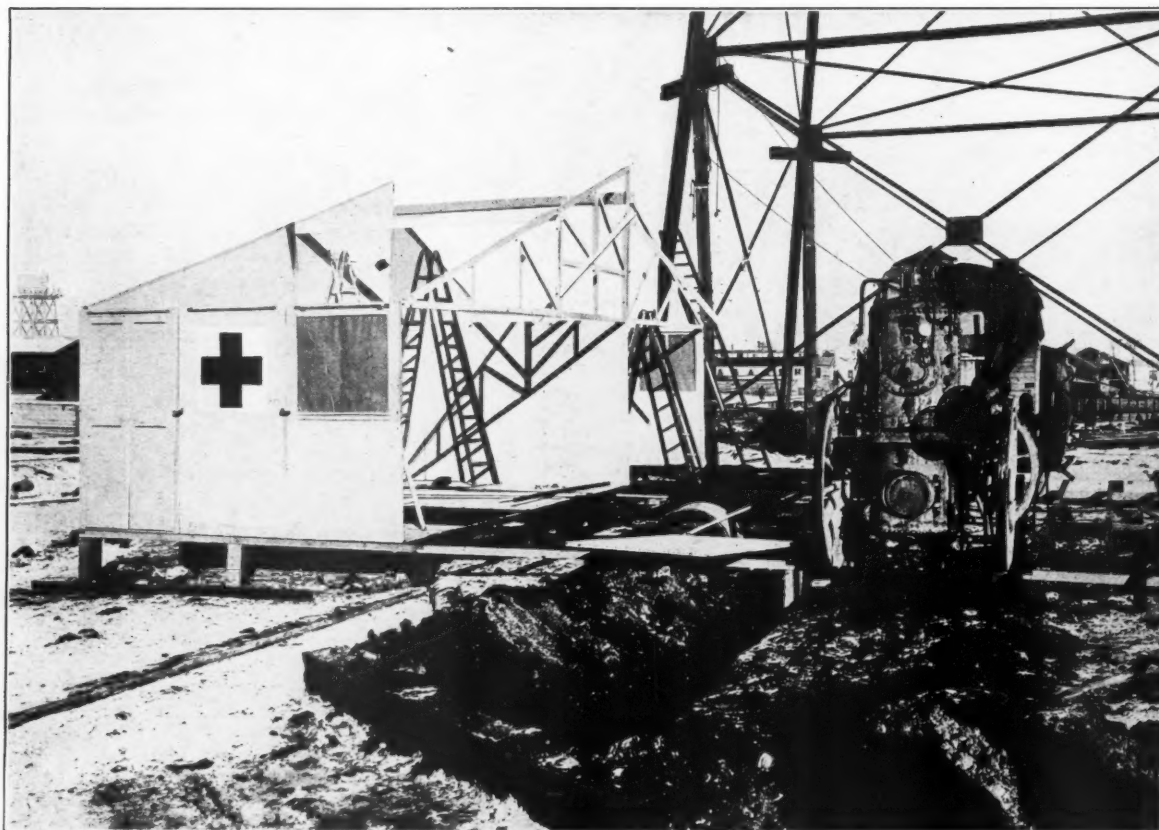
racks employed by the French, while advisable for housing troops, do not have sufficient window space for hospital or recreation purpose. Nor are many of them so constructed as to be easily heated for ordinary living purposes.

So the Construction Bureau architects designed a new design of semi-portable barrack to meet its own needs. It is built in panels, has double walls, a floor and a ceiling, and window space enough to make it practically a sun parlor. When properly erected it is practically a permanent building although it can, if necessary, be taken apart and moved to another site. Its standard dimensions are 6 x 30 metres (20 x 100 feet), but it can be lengthened or shortened to any practicable

them and have a barrack. To facilitate this, an ingenious system of numbering parts was also devised which enables the quick determination of the number of parts necessary to form a complete barrack.

This barrack is now well known over most of France. The French call it the "*Baraque A. R. C.*" They seem to think it a fine barrack and call it "*Joli*"—which does not mean what it does in English.

When the designing of this barrack was complete, it was found that all large firms specializing in this line of manufacture were fully occupied with their work for the French and other branches of the American army, but an American firm claiming to have good French connections agreed to take the first contract for 100 of



RED CROSS CONSTRUCTION WORK AT AN AMERICAN AVIATION CAMP IN FRANCE

This shows the shower baths given to one of the camps by the American Red Cross being put up. The building is of the "demontable" type, a wooden structure built of panels supported on trussed framework. On the right is seen the machine for heating the water.

dimensions by adding or leaving out side wall, floor and roof panels. Partitions can be installed if necessary and all sorts of interior arrangements are therefore possible. Like most of these barracks its roof is supported by trusses rather than by a complete framework such as would probably be used in strictly American practice—for its designers admittedly are indebted to the French for many of the ideas involved. It is designed to have the complete barrack an assembly of a number of absolutely standardized parts like a cheap modern automobile so that we might take a series of parts from half a dozen plants not under the same management, assemble

these barracks. Practically all of it they turned over to a large French engineering firm. They had facilities for only part of the work and so further sub-contracted a large part of it to other smaller firms scattered all over France. In this way a new line of firms, not before engaged in barrack manufacture, were brought into use and pressure taken off those who had all they could do to supply the regular demand of the French army.

At this point the work of supervising the manufacture of these barracks was turned over to the writer. In the months since, it has brought me into the forest regions of France and into touch with its timber industries, and

enabled me to be the first representative of the American army (for in France the Red Cross is as much a part of the army as any of its branches) to enter a dozen or more places in France remote from the war zone; and my reception has everywhere been a convincing testimony to the deep feeling of friendship which the French people have for the Americans. It is greatly to be regretted that my elementary knowledge of the French language has not always enabled me likewise to carry to the people of these remote places the assurance of the profound respect which American people at this time have for their French Allies.

There are a number of conclusions which seem evident to me after more than six months of travel in the forest regions of France which may be of interest to readers of this magazine.

It is said that after Nelson destroyed the French fleet at Trafalgar, Napoleon's chance of invading England was forever gone as there did not exist in France any

ments of forestry troops in the French, Canadian and American armies, besides numerous prisoners of war, mobilized laborers of all kinds under the sun, and French civilians too old or too young for military service, are all found at work throughout the wooded districts of France turning forests into "*Materiel de Guerre*" of all sorts. These operations are largely, of course, on the French national forests and are under strict supervision of the French forestry officials, and the cutting is made entirely on scientific forestry principles.

Most of the timber which is used by various contracting firms is cut from private forests. So great has been the demand for timber for war enterprises not directly under the control of the army that a great deal of speculation in privately owned forests has resulted. The Government exercises no severe control over these private transactions and from a French point of view they are lumbered therefore in a very reckless fashion, but regarding them in the light of some of our own destruc-



Underwood and Underwood—British Official Photograph

WORK OF THE BRITISH FORESTRY FORCES IN FRANCE—STACKS OF CUT WOOD AT A SAW MILL

From such points all over France, timber in all manufactured forms flows in a steady stream to the various construction units, for wood is a vitally necessary thing in carrying on both offensive and defensive activities. Now the American lumber and forest forces are backing up the splendid work of the Allies, with sawmills humming night and day, there is no fear that this need will not be met. The supply of timber needed will be constantly available, until the Hun is brought to his knees.

forests capable of supplying timber for constructing new fleets again to challenge England's sea supremacy. Perhaps that was a convincing argument to the French people of the need of a forest policy. At any rate, one of the sources of strength to France today is her forests. The demands which war makes upon the forests for wood materials, ranging all the way from heavy bridge timbers to poles and pine boughs for camouflage screens, is enormous. If France could not in quite a large measure supply not only herself, but her English and American allies as well with these products, the increased burden placed upon the world's ship tonnage in transporting this material presumably from America might be nearly insurmountable. As it is, several regi-

tive lumbering operations they seem quite conservative.

All through the wooded regions of France new sawmills have sprung up to supply the demand for lumber. Most of them operate on an exceedingly small scale. Many are operated by water power and employ a few old men and boys, and sometimes women work at the lighter tasks. From our point of view these mills are exceedingly primitive. I have not seen anywhere in France a sawmill capable of turning out 75000 feet of lumber a day. Most of them would scarcely turn out 2000 or 3000 feet. Many of them operate by old fashioned water wheels and use "up and down" sash saws—a form of machine all but obsolete in America. Others have circular or light band saws. Many of the carriages are

hand operated and fed against the saw solely by man power. A few rack and pinion carriages are seen, but they are low geared and slow—very slow of operation. The sawyer sets a log on the carriage and starts it on its way through and then goes out to peel the bark off the next log while the first goes through the mill. Automatic set works on the carriages seem to be unknown, the sawyer figuring out with an ordinary metre stick what he can get from the log and where to set his head blocks accordingly.

The surprising thing about it all is the good results obtained with this exceedingly primitive machinery. The lumber is uniformly well manufactured, much better so in fact than from many of our large mills, and the percentage of waste is quite small.*

Although the French Government seems to exercise

little control over the cutting of private timber it exercises, in numerous ways, a very definite control over the production and distribution of finished lumber. First by its control over the labor supply and second by its control of railroad transportations. The mill

owners can secure as laborers only persons not subject to military duty, and there are very few men able to do satisfactory work at a saw mill who are not so subject. Many also of the owners of the mills have been relieved from the army solely on the understanding that they operate their mills to furnish the French army with a given amount of lumber for

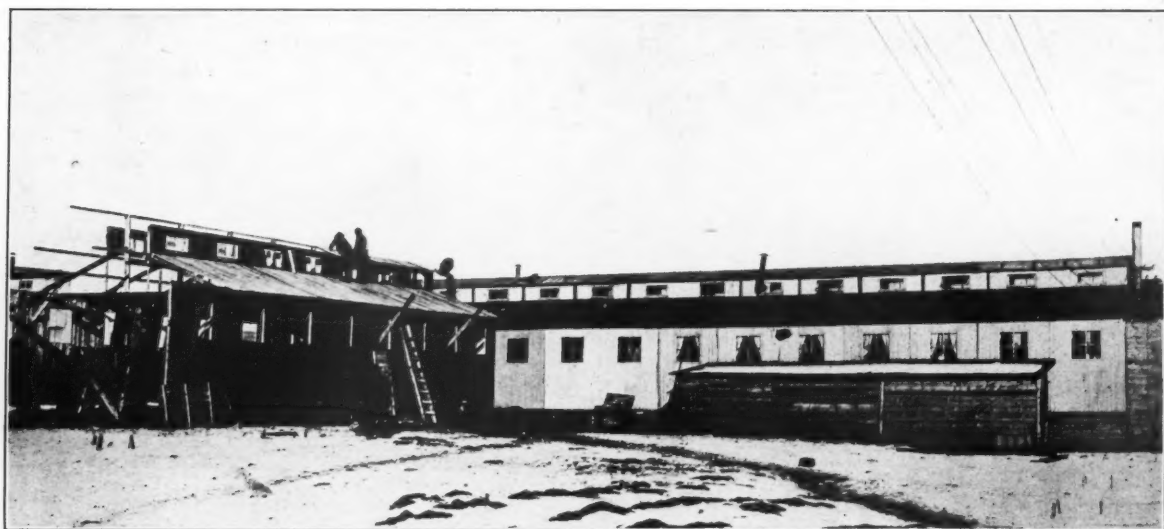
which they are paid a standard price. If they are able to produce a larger amount they may sell it to other parties. In this way the American army and various of its subsidiary services have bought much of its lumber. An amusing site which for a moment makes us forget



Committee on Public Information

BUNK, NOT BARRACK CONSTRUCTION

This shows the cozy bunk of an artilleryman in France. It is wooden construction of the rough-and-ready but most necessary kind.



BARRACK CONSTRUCTION BY THE AMERICAN RED CROSS

The impossibility of carrying on all the activities of the American army in France under canvas, or in available village billets, was quickly recognized and the huge army is being housed in rapidly constructed, but most substantial and comfortable barracks. This same need was met by the American Red Cross in organizing its tremendous forces in the service of mercy, and out of this need grew the "Bureau of Construction." The result was not only the building of hundreds upon hundreds of the "demonable" and standard type of barrack for the special use of the Red Cross, but the designing of a new, semi-portable barrack, with particular construction specifications and advantages. This barrack is now well known over most of France, and the French call it the "Baraque A. R. C."

the sterner side of war is: a French mill owner offered a high price for his product by the Americans knows that if he fails to deliver the larger part of it to the French at a lower price he will be ordered to again shoulder his musket and go to the trenches.

The French Engineer Corps, "*le Genie*," have representatives, generally officers or non-commissioned officers at all the large mills and other regional representatives who cover the smaller ones. These men keep account of the production and look after the expedition of the material. Under certain conditions they have the

power to requisition all wood supplies for exceptional needs of the French army. It sometimes happens, as it did when the writer was concerned, that a French officer is called upon to commandeer some material in transit for A. R. C. use. Such a situation calls for delicate handling, but with both parties trying to find an amicable way out the difficulty is somehow overcome, as are many others in the complicated inter-relations of the French and Americans.

* Editor's Note:—This article was written before the American (forest) regiments landed overseas and commenced production, since which time timber of all kinds has been produced in immense quantities.

THE HUN OF PLANT LIFE

NOW we have the Vegetable Boche! This freak of Nature finds its way to the heart of a bulb and bores right through it as Miss M. L. Long, of Enfield, New Hampshire, well knows. Miss Long sent a picture of the operation of the Vegetable Boche to the



THE HUN OF PLANT LIFE

This is the photograph of the "Vegetable Boche."

American Forestry Association of Washington with the following letter:

"I am sending you under separate cover what I call a Vegetable Boche; a real case of a stab in the dark. The bulb is one of several I brought from Constantinople, where my father was stationed for many years at Robert College. The bulbs, not doing very well this spring, I decided to take them up and dry them for another season. The pushing qualities of New Hampshire witch-grass may not be familiar, but this specimen, which has pierced the heart of the unoffending bulb, may give the uninitiated an idea of ruthless efficiency in the vegetable kingdom."

Another thing the pest likes is potato, so keep your eye out, war gardeners, for the potato is a very important garden article at this moment.

TREES FOR THE DEAD

IN the Passaic "Daily News" we read that the city of Cleveland has hit upon an admirable type of memorial for war heroes. The fallen soldiers are to have living monuments. Their memory will literally be kept green.

A boulevard is to be consecrated to them, bearing some such title as "Liberty Row." It will be lined with "Victory Oaks." There will be an oak tree planted there for every Clevelander who makes the supreme sacrifice. It will bear a bronze tablet inscribed with his name and military record. The planting of the trees will be made a civic ceremony, in which the relatives of each hero will participate.

What more fitting form of commemoration could there be for the boys who give their lives to their country? They themselves would doubtless prefer such monuments to marble columns. The trees will be, in their very greenness and robust strength, reminders of the youths who gave their vigor to win the big war. There will be no gloom about them. They will stand as a continual inspiration for the living who look upon them and are sheltered by them from sun and storm.

Such a fine innovation, one would think, needs but to be mentioned to win universal approval. Why should it not be adopted in this city? Why not be made a national institution?

PUT THE SUN TO WORK

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

OLD SOL is doing war work! The sun has been drafted! Yes, he's helping Hoover and the war gardeners now! His is no eight-hour day. He has to toil from the time he rises until he sets on food production.

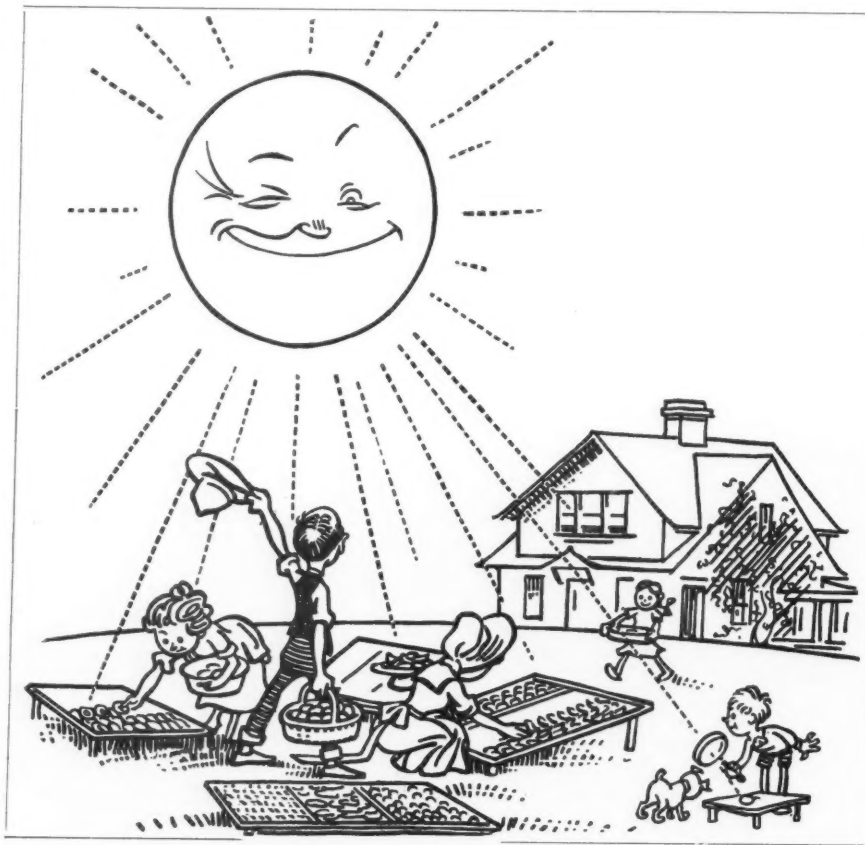
The secret is out now. Have you ever wondered why the war gardeners, among others, were so anxious for the "daylight saving?" Well the answer is:—they are making the sun work overtime for them drying food. Yes, **DRYING** it.

To be sure it is called "dehydration" now, but don't let that word scare you. It's the same old secret known to our grandmothers, great grandmothers and far more distant forebearers, and much practised by our predecessors, the Indians. Why, even the Egyptians knew all about it, as the stores of "dehydrated" vegetables and fruits found in their temples will testify. Our old friend, Joseph, the first food administrator of whom we have any record, got his job through his big idea of having Pharaoh corner all the corn in the year of a big yield and "dehydrating" enough of it to keep the nation going through several years of scarcity. The rest of us can do as well as he did, for the only intelligent co-operation he could get was that of Old Sol who is working just as well now as he did then.

That there will be plenty of vegetables to dry this year is shown by reports to the National War Garden Commission on the number of war gardens in the United States. Much of the vast amount of garden surplus will be canned; but large quantities will also be dried. The saving of sugar and of jars, the ease and cheapness with which the work is done, and the compactness of the resultant product, are among the factors which make this

method of conserving food appeal to the people.

Estimates based on early returns to the National War Garden Commission show that there are more than 4,900,000 war gardens in the United States this year. In nearly every section of the country there has been appreciable and encouraging increases, the greatest percentage of increase being noted in the central western and Pacific coast states, which reported a total of 2,276,000 war gardens. The eastern states including New



AMERICA'S "PLACE IN THE SUN"

This is the way the war gardeners of the United States are harnessing the rays of Old Sol to make him help beat the Boche. Dried vegetables prepared for the British army in South Africa during the Boer War were opened recently and found to be as good as ever. They are only one-third as bulky and weigh only one-sixth as much as fresh products, and hence effect an enormous saving in transportation.

England, New York, Pennsylvania, New Jersey and Delaware showed 848,000 war gardens, while the South, counting in Texas and Oklahoma, has 1,246,000.

Taking these early figures together with the increased canning demonstration work being done by the United States Department of Agriculture in cities and towns, we feel safe in saying that the 1,500,000,000 quarts in tin and glass of canned stuff forecast by the Department will

be reached. Drying of garden products, however, is going to make the amount of food stored away for next winter's use much larger than it would be otherwise.

This old-new idea of food drying has taken forcible hold of the American people. Revived at this time of imperative need and great scarcity, it has appealed to everyone through its practicality. Food so prepared is wholesome, palatable, and extremely cheap. From being the preoccupation of scientists, the subject of food drying has come to be, next to the war itself, the biggest topic of the day.

Individuals and communities are taking it up. Mrs. Oliver Harriman's big food-drying demonstration in the Grand Central Station of New York has attracted large crowds who have gone away, resolved to "go into" the subject more deeply.

John A. Orr, the able and energetic manager of the Bridgeport Home Garden Committee, who has thoroughly investigated the subject, set himself to raise \$10,000 for a dehydrating plant in his community, where there are between 800 and 1000 acres in war gardens, and where potatoes are being produced at a rate that will materially cut the cost of living for the fortunate Bridgeporters next year.

In order to insure themselves of a normal food supply next winter the American people must preserve the excess this summer, and since drying is more economical than canning it is coming to play a larger part this season than ever before. The ease with which it is done is a strong point in its favor and practically all vegetables and fruits may be dried.

In addition to drying by the sun, the simplest method of all, food products may be dried by artificial heat and

by air-blast. Many persons insist that dried products are the coming big factor in food conservation and that they are superior to the canned preserved goods.

Manuals fully explaining the three methods of food drying issued by the National War Garden Commission of Washington have been distributed by hundreds of thousands all over the country. Indeed, the question of food drying has taken the American housewife by storm.

The United States government is taking up the subject very thoroughly and has experts who are making it a special study.

A bill to appropriate money to establish drying plants throughout the country is now before Congress. Community dryers are an old story in France, Belgium and Germany. Were it not for the big food dryers in Germany, where dehydrating plants have been increased from 400 at the beginning of the war to more than 2,000 at the present time, it is doubtful if the Kaiser's wretched subjects could exist at all. The Germans have found this method extremely economical.

The establishment of community canning and drying kitchens is one of the most striking changes which war has brought about and promises to become a permanent feature of our civic life. The plan has been thoroughly tried out in a number of widely separated communities

and has been found to be entirely practicable and a great saving of money, time and labor.

The statement that \$19,000,000 would be saved in transportation each year as the result of the more universal application of the drying process to fruits and vegetables in this country alone was made by Dr. F. F.



THE WAR GARDENER ANSWERS PERSHING'S CALL

Bread and Bayonets will beat the Boche so say the war gardeners of the United States who have, according to reports received by the National War Garden Commission, jumped the number of war gardens 40% over those in 1917. The war gardeners are eligible to compete for the ten thousand dollars in thrift stamps the Commission at Washington is offering for the best canned vegetables grown in war gardens.

Bowers and George T. Renk, of New York, who made computations. The water in food products adds 100 to 900 per cent extra weight and leads in cold weather to freezing. In New York City last winter thousands of dollars were lost through the freezing of fruits and vegetables. For this reason hotels and other buyers of food in large quantities heartily endorse the new method.

Community canneries and dehydrating plants are the up-to-date American solution of the food problem. "In union there is strength" has been clearly demonstrated in the united effort to rout the foe, Food Shortage. Organization is the watchword of the day and is just as valuable in solving the food problem as in any other difficulty.

Massachusetts has made an enviable record in community canning and drying. More than 80,000 quarts of fruits and vegetables were canned in community kitchens last year throughout the State. In addition to the canning several hundred bushels of products were dried. Thirty-five or more communities were organized to do work along lines of canning and drying. All were very successful in that they increased quite largely the preservation of food materials. Loss from spoilage was very small, in no case being more than two per cent and in most cases running less than one per cent. The cost of doing the work where volunteer labor was used was very low, running from 3 to 7 cents per quart, with an average price for all fruits and vegetables of 6 cents per quart jar. In those communities where all paid labor was used, the prices ran from 7 to 13 cents per quart, with an average for all products of 10 cents per jar. Items included were labor, sugar, salt and rubber rings.

The views of David Fairchild, agricultural explorer in charge of the bureau of plant industry, United States Department of Agriculture, on the important subject of drying vegetables, follows:

"I believe the American public should learn to use dried vegetables, because in so doing great economies can be brought about in this country as they have in Germany and Austria. The dehydrated vegetable saves transportation of both bulky fresh vegetables and bulky canned vegetables, not only those portions which are actually consumed but the waste which forms so large a part of the garbage of our cities. The dehydrated vegetable saves tin, since it can be put up in paper containers. It saves labor in the small home where the convenience of its use is apparent. It saves in wastage at the point of production and in the home. We little appreciate how gigantic the wastage of fresh vegetables is, and this wastage is largely because the vegetables are too cheap on the market to warrant a grower to ship them to it, and it is here that dehydration should play an important role.

There is nothing in the vegetable situation which confronts us today to assure us of cheaper vegetables in the future. We must not forget the small proportion of women gardeners in this country as compared with the women field workers of France and Germany and even England, and vegetables require a large amount of hand labor to produce. Where is the labor coming from?

"Possessing as we do such remarkable food as Indian corn, and having learned as we have to like it, there would seem to be a danger that we depend too fully upon it and, with the increasing price of vegetables, fail to realize that as we increase our corn consumption we require greater quantities of milk, meat, fats or vegetables to supply the food essentials lacking in corn. As the fresh vegetables become scarcer on the markets, it would become more and more difficult to do this, and the result predicted by dieticians is malnutrition among those who think they cannot afford to buy the vegetables. We should learn to use these dried vegetables to supplement the grain ration.

"It is easy to see a hundred reasons why we should not eat

THE attitude of the Food Administration is exemplified by the following letter received by the Commission:

Mr. Charles Lathrop Pack, President,
National War Garden Commission,
Washington, D. C.

Dear Sir:

It is highly gratifying to those having food conservation at heart to see the great interest now being taken in vegetable drying in the homes throughout the United States. One of the most vital needs of America and the Allies is that the food supply be developed to the highest extent and that waste of every sort be prevented. If this is done, there will be an abundance, not only for the people of America, but for the suffering countries of Europe as well. Home drying of fruits and vegetables is an important contribution to the attainment of this aim and it should be accepted as a patriotic duty of every household.

It is undoubtedly true and should be so recognized that the home dried products will vary in uniformity and appearance and that the best results of dehydration at the lowest cost of production will undoubtedly be obtained when the process is developed upon a commercial scale. As yet, however, the commercial development of the industry has not been perfected nor has it reached a scale that will meet the nation's needs for this form of conservation.

Before this can be done there must be real demand for products prepared by this method. The success of home drying during the past few years has gone far to acquaint large numbers of consumers with the desirability of foods preserved by this method and warrants the assurance that the home drying movement of 1918 should be expanded as much as possible and so made an important part of the national program for food conservation.

Dehydration has come to stay in this country and while it may still be regarded as in the experimental stage, those who are most familiar with the problems of food production and conservation are firm in the opinion that we are seeing only the beginning of what is sure to expand into an enormous and most important industry.

The impetus given to the process of canning by the Civil War bids fair to be outrivalled by the impetus given to this simpler and more universally applicable method of food conservation and there seems to be no reason why the abundance of one season or one locality should not be made available by this means for periods of scarcity or for regions where fresh fruits and vegetables cannot be obtained.

Every encouragement, therefore, should be given to home drying, in order that the people may become familiar with the excellence of the products which may be prepared by this method, and to save the vast quantities of excellent food which now goes to waste for lack of adequate methods of conservation.

Very truly yours,

LOU D. SWEET,
U. S. Food Administration,
Dehydration Section.

dried vegetables, but it is unscientific and unpatriotic to shut our eyes to their possibilities. As a people we should move ahead into the field of dehydrated vegetables, develop it, discard what is not good, hold what is good, and make it a means to stabilize those vegetables the price of which fluctuates now in a most unsatisfactory and dangerous way.

"While I believe that we should consider first our own attitude toward dried vegetables and work out the best methods of using them for ourselves, we are warranted in believing, as conditions are at present in Europe, that there will be need of large quantities of all kinds of foods, including these dried vegetables, in those countries which are now famine stricken. Although it is undoubtedly true that the German troops are using enormous quantities of dried vegetables, it is not demonstrated to what extent they will be employed in the feeding of our own boys. No civilian will take the attitude that the boys should be fed on food which he himself refuses to eat. If we learn to use them extensively, it is a practical certainty that our own armies will employ them extensively, as have the armies of Great Britain, France and Germany."

Drying eliminates some of these items and also the expense of the glass can.

Much enthusiasm was shown at the state-wide conference to promote community drying and canning, called in Horticultural Hall, Boston, by the Massachusetts Board of Food Administration.

"Give me one ship to load with vegetable foods and I will land the same amount for

our boys 'over there' that it takes ten or thirteen ships to carry at present," says Miss Clara Endicott Sears, founder of the Harvard Canning and Evaporating Club.

The Club, organized only last year, was managed by Mrs. Frederick G. Avery. It produced for the consumption of the soldiers at Camp Devens, quantities of peas, corn, blackberries, blueberries, damsons, sweet potatoes, carrots, beets, apples, peaches, all in the form best suited to prevent perishing. The girls of Ayer volunteered for the work and soon developed great enthusiasm. The club hopes to treble its work of last year.

The value of dried vegetables and their keeping qualities are shown by the fact that a lot of this food kept from the time of the Boer War was opened recently and found to be as palatable and as nutritious as the

day it was put up. This had been shipped from Canada to South Africa for the British forces there, but on account of the termination of the war a large supply which was on hand was retained in England.

John Hays Hammond, the famous international engineer and a member of the National War Garden Commission, who knows much of South Africa in Boer War days from his work there in the development of that territory, is authority for the statement that the British soldiers could not tell it from the food they were accustomed to, and they thrived on it.

"It was probably due to its success at that time," said Mr. Hammond in speaking of the subject, "that the British War Office and the French Governments have purchased large quantities of dried food in Canada during the present war for the soldiers in France. Our own

quartermaster's department, I am informed, has purchased several thousand tons of dried vegetables and plans have been approved for the possible purchase of up to 20,000,000 pounds of such supplies. My friend, Dr. Charles L. Lindley, of Lakewood, N. J., an army surgeon during Lord Roberts' campaign, with whom I recently talked, confirmed every claim that can



AND SQUASH IN WINTER

His Highness the Squash may not be much on looks when dried but he makes up for it in taste. Here are shown the difference in size before and after the drying process.

be made for dried food as a valuable army's ration.

"When we consider the great saving in handling which can be effected, also the cargo space, the smaller number of trucks required for hauling the quartermaster's food supplies and economies in other ways, it will be readily seen that this is an eminently worth while project from a military point of view, and many of the same or similar reasons make the preservation and use of dried foods by our civilian populations of equal value from an economic and patriotic standpoint."

Listen to what Lou D. Sweet, president of the Potato Association of America, popularly known as the "Potato King," whom Mr. Hoover made head of the dehydration section of the United States Food Administration, has to

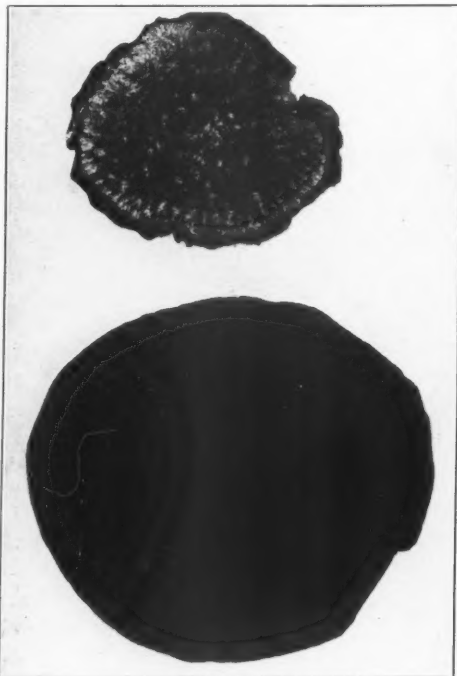
say on this important subject. In a letter to the Commission he says:

"Dehydration has come to stay in this country and while it may still be regarded in the experimental stage, those who are most familiar with the problem of food production and conservation, are firm in the opinion that we are

seeing only the beginning of what is sure to expand into an enormous and important industry. Every encouragement, therefore, should be given to home drying, in order that the people may become familiar with the excellence of the products which may be prepared by this method, and to save the vast quantities of excellent food which goes to waste for lack of adequate means of conservation."

The saving of transportation space, a vital problem now, caused the United States Army Quartermaster's Corps to buy large quantities of dehydrated vegetables for the soldiers of the American Expeditionary Force in France.

Canada is doing good work in dehydration, according to Joseph D. Bates, of Springfield, who made a tour of the Dominion. "I visited the plant of the Graham Company of Belleville, Ontario," said Mr. Bates, "where they were on an order running about \$5,000,000 worth of dried vegetables, more particularly a soup mixture. They dry by a simple method consisting of cabinets into which wire trays are placed. The drying is done by steam pipes underneath the rows of trays. "Why has so little been done in drying in this country?" Mr. Bates asks. "The preservation of food is vital and the food-drying method is not new, but has been experimented with abroad for many years. The question cannot fail to come; why have we done so very little



YES, THIS IS A TURNIP!

Before and after soaking you can see what happens to the turnip. Dried vegetables are the thing nowadays. The process is simple and when it comes to putting food away space conditions can always be met by drying.

with it? I put that question to a number of authorities in Washington. They say it is because people do not know about it. It seems to me that this necessary and practical knowledge should be brought to everyone's mind. The great difficulty," he continued, "is that the public is slow to take up new foods and new methods of preparing foods. We must begin in the homes by having all the home dryers necessary, no matter how simple, installed. Get people to know drying as they know canning. Get them to realize what a protection for their families it is to dry food. A drying plant, used much as communities used the old-time grist-mill, should be installed. Families could bring their surplus here to be dried, paying a small sum for the service, or leave a small percentage of their products."

Mr. Bates estimates that a dried pound of vegetables costs about sixteen cents, exclusive of the drying. This is estimated on the basis of an original cost of two cents a pound—a fairly high estimate. Eliminate peelings and there is left a drying weight of about one-eighth. This drying process depends upon conditions. If the owner wishes to leave material in a dryer without moving air it will dry cheaper, but it takes time and space. If current is attached it adds to the expense. Some plants, said to be commercial ones, run as high or even higher than double the cost of the fresh material. Thus if the cost of the fresh material was sixteen cents a pound the total cost of the dried pound will be thirty-two cents. Commercial dryers operating with labor-saving machinery can bring this down

to one cent, one-half cent, and, in Germany, they figure one-quarter of a cent a dried pound.

Buffalo, New York, has taken the lead in establishing a community drying kitchen, which was opened near the city market as a means of utilizing the market waste. Its excellent record has not only given the whole city an object lesson in food conservation, but



THE BEET WILL FOOL YOU

The way the beet comes back to natural size is astonishing and that is one of the virtues of drying the things that take up so little room.

has pointed the way to the whole country to a means of preservings vast quantities of redeemable food. Such kitchens promise to become a city institution throughout the country.

The kitchen was opened last September and has only been operated with full equipment since February 1st. It will dry all summer on shares for farmers and others. It buys produce on wholesale figures. Most of the equipment was donated, a vacant store opposite the market serving as headquarters. It is under the direction of the city conservation agent of Buffalo and her assistants, the actual work being carried on by a drying expert. The output has been principally onions, potatoes, turnips, carrots, cabbage, celery and Julienne soup mixture. Onions have been most in demand but the soup mixture is a great favorite. A quarter-pound package, which sells for twenty-five cents, makes two gallons of soup. There is also a package selling for fifteen cents, enough for one gallon.

Through the efforts of this kitchen the propaganda for dried food is spreading rapidly in Buffalo and the

sales keep pace with the production, averaging about \$25 a week. The saving in transportation, in storage, in labor, in containers and in loss through deterioration is so great as to make it absurd in these days of terrific strain and great need not to exploit to the fullest the possibility of drying.

Mutual dehydrating may be divided into three classes: (1) Two or more families working together with equipment bought or made for the use of all; (2) Neighborhoods organized through a woman's club, church, or some existing organization; (3) Communities, organized through the local Council of Defense, the Mayor's Committee, the Chamber of Commerce, or the Woman's Club. Through neighborhood work any number of families from two to fifty may work along the lines of mutual drying. One set of apparatus will serve for all. The cost thus divided will be small for each household. The results will be of vast value, as each family will be thus prepared to feed itself next

winter and he who feeds himself helps to feed the nation as well.



ALL THE SWEETNESS STAYS

The dried sweet potato answers readily the drying process and loses none of its sweetness.

LUMBER BRINGS BIG PRICE IN GERMANY

THE Berliner Boersen Zeitung, we read in the Pittsburgh Sun, states that the prices of all sorts of lumber in Germany have risen to astounding heights. Latterly the requirements of the army on the eastern front have considerably diminished, but orders from the railway car factories have greatly increased. The most serious factor is the scarcity rather than the high price level. Indeed, it is a serious problem to keep the flying machine factories supplied with sufficient wood. Material for these factories is so scarce that none of the wood usually discarded in sawing is now thrown away. Concerns that do not belong to the flying machine syndicate have to pay at least £31 (\$151 at the normal exchange rate) per 1,000 feet at the station in East Prussia; concerns that belong to the syndicate pay £25 (\$122) per 1,000 feet, the price fixed by the war office.

Ash also is very scarce and the price is as high as £45 (\$219) per 1,000 feet of round wood. This figure

is the fixed official price for sawed ash, but it does not even represent the average level of prices paid for "free" ash. Alder costs £22 (\$107) per 1,000 feet, when it is obtainable. Basswood is very much in demand. The demand for oak is especially heavy, owing to efforts to replenish depleted stocks. Undoubtedly prices for oak will increase still further when the furniture industry resumes activity.

OF the 52 ships that went into the water on the Fourth of July, those built entirely of fir have an aggregate of 86,000 tons, and those partially of fir have an aggregate of 52,000 tons, making a total of 138,000 tons out of 185,000 tons that were launched. Including the launchings of the Fourth, a total of 119 wooden ships have been built since the present activity started. Of this number the yards of Oregon and Washington have launched 69—the Oregon district 38 and the Washington district 31.

A TWO-MILLION DOLLAR GARDEN PLOT IN NEW YORK CITY

STANDING bravely in Bryant Park on Forty-second street in New York City where all may see is the "Little Garden House" of the National War Garden Commission. The Library is on one side and the Y. M. C. A. Hut on the other, while all around are towering buildings. From this vantage point the Commission, through Park Commissioner Grell and A. N. Gitterman, of the War Garden Committee, garden instruction is given out daily to thousands. Here poisonous weeds

"I consider this one of the big things the National War Garden Commission has done," said Mr. Gitterman, who has conducted the campaign for war gardens on Manhattan Island. "We have given out thousands of the Commission's garden books and other bulletins. Park Commissioner Grell has been of great assistance to the garden committee and the planting of a garden on Forty-second Street has placed the message of 'Food F. O. B. the Kitchen Door' before the thousands



THE FORMAL DEDICATION OF THE GARDEN HOUSE IN BRYANT PARK

At the dedication of the "Little Garden House" Park Commissioner Grell, at reader's left, received the key from Russell T. Edwards, director of the educational section of the National War Garden Commission (center) while A. N. Gitterman stands at the reader's right.

are fenced in by Dr. Miller who points out the characteristics to the city farmer.

Early in the spring the first spade of earth was turned by Charles Lathrop Pack, president of the National War Garden Commission, and from that moment thousands have watched with interest the progress of the garden. The ground used to plant this garden is easily worth two million dollars could it be used for mercantile purposes.

who use this famous street. We have had inquiries from people from every quarter of the globe and when the National War Garden Commission built the 'Little Garden House' it soon became known as the place to find out things about gardens."

Now that the canning and drying campaign is on, the war garden committee is continuing to work with the National War Garden Commission and the Commission's canning and drying books are being given out there also.

SHADE

THEODOSIA GARRISON, IN EVERYBODY'S MAGAZINE

The kindest thing God ever made,
His hand of very healing laid
Upon a fevered world, is shade.

His glorious company of trees
Throw out their mantles, and on these
The dust-stained wanderer finds ease.

Green temples, closed against the beat
Of noontime's blinding glare and heat,
Open to any pilgrim's feet.

The white road blisters in the sun;
Now half the weary journey done,
Enter and rest, O weary one!

And feel the dew of dawn still wet
Beneath thy feet, and so forget
The burning highway's ache and fret.

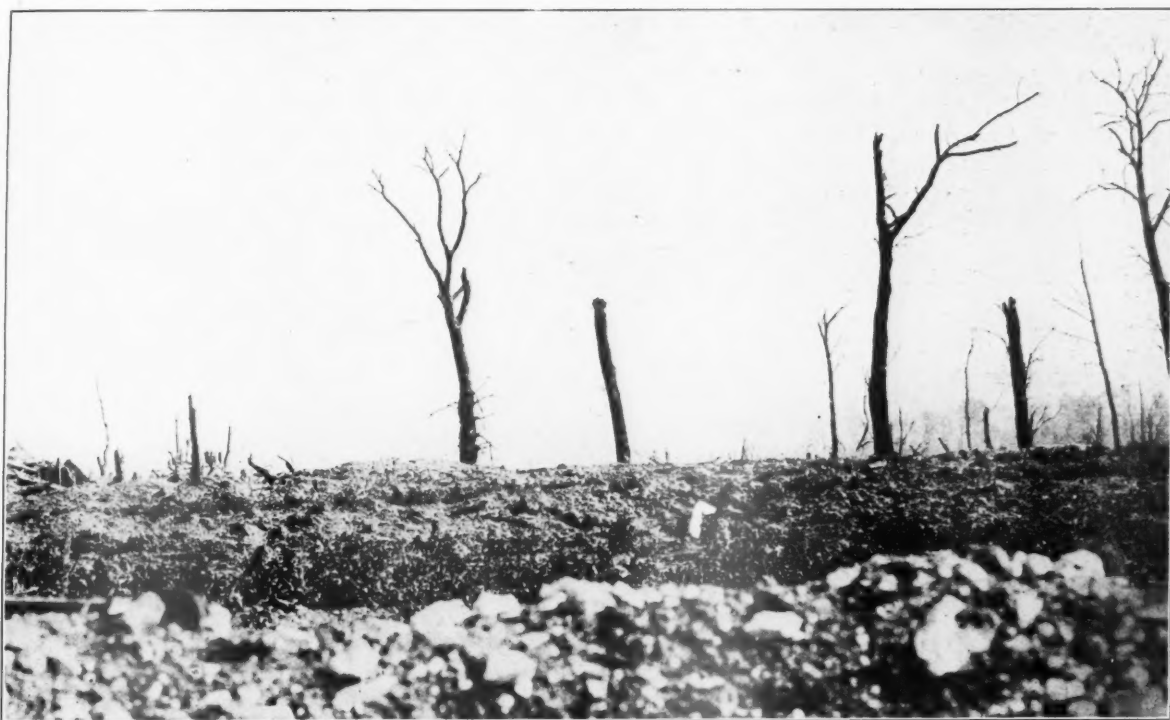
This is God's hospitality,
And whoso rests beneath a tree
Hath cause to thank Him gratefully.

WAR DEMANDS THREATEN HISTORIC FOREST OF FONTAINEBLEU

WILL the forest of Fontainebleu have to be sacrificed to military purposes, questions a dispatch of the Associated Press. This matter is agitating French historical, artistic and literary circles. There is little of these questionings in the practical military mind and it is believed probable that before long the ancient forest will resemble a lumber camp on the Ottawa or the St. Maurice River.

The drain of lumber during the present war has been very great. With the difficulty in transportation growing more and more acute the supply of timber has had

It was felled at the request of the king. Its heart was rotten, but it was still bearing foliage and yearly adding new wood. Care had been exercised through the centuries to preserve it, a circular fence screening it from the deer. It was sixty-five feet high, with a wide, branching top. With all their experience with trees the Canadians hardly knew at first how to get it down. Their ordinary crosscut saws are only five feet in length, but for this gigantic oak they needed a saw some fifteen feet in length. Such a saw they ordered, and it was finally delivered, but not until the enterprising Canadian spirit



International Film Service

RUINED FORESTS IN NO MAN'S LAND

Must the beautiful forest of Fontainebleu be sacrificed to meet the exigencies of war? This is a question now agitating many minds, but far better that it should be cut clean and the timber used for necessary construction work than that it should share the fate of this once beautiful bit of woodland in sunny France—now a desolate, shell-torn spot where the naked trees lift gaunt arms to the sky, calling for retribution.

to be obtained from local tracts instead of from the virgin forests of northern Canada.

A cable from London to the New York Globe tells us that one of the most picturesque and memorable pieces of work by the Canadian Forester Corps in England was the felling of the "William the Conqueror Oak," which stood beneath the king's window at Windsor.

For several reasons this was perhaps the most remarkable tree in the British Isles. It was more than 1,000 years old. Authentic records show that it was standing where the Canadians found it as long ago as 900 A. D. The tree was thirty-eight and one-half feet in diameter at the base.

had solved the problem. Into the heart of the trunk a hole was cut and a sawyer placed inside. The sawyer inside working with the fellow outside, cut gradually around the trunk until the ancient monarch fell.

The heart of the tree was cleaned out and the hole filled with cement to avert further decay. The wood is susceptible of the most beautiful polish and doubtless the main portion of the trunk will keep permanently. Some small souvenirs have been given away. Needless to say, they would command large prices if sold at auction. In a typically Canadian log cabin built for the king at Windsor, the mantelpiece is made of wood from the old oak. This cabin structure is of

great interest here. There is not a nail in it. The logs, which are of larch, are fastened with wooden pins. The roof is of bark, the floor logs were hewn by Corporal Mount Ford, a French-Canadian who used only an ax, and did the work so skillfully that a six-pence cannot be dropped between them. The floor logs rest on pillars. No plane was used on any part of the building. The larch, or what is called in Canada and the United States, tamarack, was the only tree that could be found straight and large enough for the cabin.

The Canadian foresters in the great park at Windsor

made the acquaintance of another extraordinary tree. This was a huge beech. Its branches extend in a radius of sixty-eight feet from the centre of the trunk. Beneath its leafy roof on one occasion 2,500 Canadian officers and men assembled for religious services.

There is a pang of regret in artistic circles, but it is remembered that England has sacrificed without murmur the beautiful trees in the Royal Park of Windsor, and it is believed that unless lumber can be obtained elsewhere under as favorable conditions Fontainebleau is doomed.

A LETTER FROM THE CHAPLAIN OF THE TENTH

THOSE who have given so generously to the Fund for the Welfare of Lumbermen and Foresters in War Service, in response to the appeals made by the committee and to the advertisements published in this and other magazines, will be happy to read the following letter received from Lieut. Howard Y. Williams, the Chaplain of the Tenth Engineers (Forest). This testifies to the grateful appreciation of the men of the lumber and forest regiments, and should bring a warm glow of satisfaction to the heart of every person—man, woman or child—who has sent his dollar to swell the fund.

France, June 10, 1918.

"Dear Mr. Ridsdale:

"The Welfare Fund is surely helping out a great deal. Have been able to buy athletic equipment, etc., for the men, make short loans

for men going on leaves, and help in many little ways. Now that packages do not come over from the States such a fund is even more necessary and we thank you very, very much for your energies in our behalf.

"I am enclosing a letter telling of some of my activities in the Tenth Engineers.

"Trusting that you will pass our appreciation on to the many givers, I am with kindest regards,

"Very sincerely yours,

"HOWARD Y. WILLIAMS, Chaplain."

It is a pleasure to our Committee to receive such a letter, and doubly a pleasure to here reproduce it for the benefit of the readers of AMERICAN FORESTRY. The report of his "doings" to which Chaplain Williams refers is printed elsewhere in the magazine.

DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to July 29, 1918, are as follows:

Previously acknowledged	\$19,544.06	Mr. D. Blakely Hoar	\$5.00
Carey, Arthur E.	5.00	In Memory of S. G. B.	10.00
Delafield, Jr., Marturin L.	5.00	Kidder, Nathaniel T.	100.00
Finch, Pruyn & Company.	100.00	Morse, Miss Frances R.	2.00
From one of the Amexforce.	2.00	Nelson, Jr., John M. (district No. 3)	10.00
Gunnison National Forest.	18.50	Vickers, Mrs. J. V.	2.00
Mrs. C. S. Haight.	5.00	Wollweber, Otis	2.00
Haskell, Rev. Joseph N.	2.00		
		Total.	\$19,812.06

BELGIAN FORESTS WANTONLY SACRIFICED BY HUNS

ACCORDING to official reports, says the *Christian Science Monitor*, information has been received at the Belgian Legation from all parts of occupied Belgium which tell of the reckless destruction of public and private woodlands. Whole forests have been destroyed in the Ardennes region, while in the less luxuriant northern provinces, even the roadside shade trees and those bordering the canals have been cut down. This damage is distinct from that inflicted by shell fire, incendiaryism, and for reasons of military strategy.

It is part of Germany's systematic raid on the economic resources of the nation, with the object in view of eliminating industrial competition after the war.

The forest industry is an important factor in Belgian activity. Statistics furnished by the United States Department of Agriculture estimated the total wooded surface of this, the most densely populated European country, at 17 per cent of the entire territorial area, or 1,300,000 acres (1910).

THE USES OF WOOD

THE PLACE OF THE WOODEN ROOF IN CIVILIZATION

BY HU MAXWELL

Editor's Note:—This is the fourth story in a series of important and very valuable articles by Mr. Maxwell on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

IF the groves were God's first temples, doubtless the trees were man's first shelters. The canopy of bough and leaf broke the sun's rays and shedded the rain while primitive hunters and root diggers huddled beneath. Nature provided that shelter, but nature did not, in that particular, go far enough to satisfy the wants of men, and they learned to cut boughs and lay rude roofs on crude shanties. In the earliest shelters of that kind, the walls were probably branches also. That was a very old type of human den or domicile, and the period of its

beginning dates farther back in the past than history or tradition goes, and it is left for us to imagine what we like concerning the first builders of brush houses. But our knowledge of later builders of that class of roofs rests upon something more substantial than imagination. It may seem strange, but it is nevertheless true, that such huts and such roofs are still being built, not only in tropical lands where lizard-infested thatches of leaves shelter human beings, but in some instances bough roofs keep the rain and sun off Ameri-



ROOF OF BOUGHS AND WALLS OF BRUSH

This is a twentieth century penthouse in a Michigan forest, but it is doubtless very similar to shelters of limbs and leaves built in many lands during thousands of years of human development. Present day men sometimes go back to primeval conditions, by necessity or for pleasure. In a snow storm this is a better shelter than none at all.



A RELIC OF OLD CUSTOMS AND TIMES

These twin barns have stood a third of a century on a mountain in North Carolina without the expenditure of one dollar for repairs—and they show it. The most prominent feature is the clapboard roofs which, though somewhat tattered, promise to outlast the walls of the buildings. The clapboards are of oak.

cans in the United States at the present day. The writer of this has seen a human abode, intended to be more permanent than a temporary camp, made of brush, both walls and roof, and within three miles of a sawmill with a daily capacity of 40,000 feet of spruce, hemlock, and white pine lumber. Thus have habits of life and methods of using forest resources come down from men of the stone age to their descendants who live in the age of air travel and electricity.

Bark peeled from trees has always been a better roofing material than brush, but not always so convenient. Bark was the Indian's chief stand-by in making shelters, though the tribes of the treeless plains where bark was not to be had, used skins. The redmen were adepts in bark peeling. Most trees peel easily in summer, but few can be stripped in winter without breaking the bark in pieces too small for roofing stuff. The Indians knew the trees which could be peeled in winter, and attacked them with hatchets and wedges to pry the bark off. Basswood was such a tree, and they knew how to heat the trunk of white elm with fire and hot water to loosen the bark for winter peeling. But they usually peeled in summer what bark they expected to need the

following winter, and they kept it under water till they needed it. This was to prevent the bark from drying and rolling up in cylinders. The Indians knew that trees growing on the immediate banks of streams could be peeled later in summer than those trees of the same species which grew on high and dry land. Bark usually constituted both the roofs and the walls of the Indians' flimsy houses.

Bark is still being used exactly as the redman used it. Temporary shelters and cabins are built of it by woodsmen and campers. Nearly every person who has spent much time in the forest, either on business or for pleasure, has had experience with bark houses. In summer when the peeling is good, a man with a hatchet can strip bark, cut poles, and erect a penthouse for a night's shelter in less than one hour, if conditions are favorable. The camper follows the Indian's

example and makes his bed as well as his roof of bark. It is nearly impervious to water, and protects the sleeper against wet or frozen ground below or rain or snow from the clouds above. Both walls and roofs of bark are more durable than might be expected, particularly if so situated that sun and wind will dry them after each soaking. The bark of some trees is more durable than the wood under similar conditions. The bark of birch logs lying in the forest may remain sound and retain the log's form after the wood within has decayed and fallen to powder. Bark is usually rich in tannin and this may



A ROOF CONSTRUCTED OF COMMON LUMBER

Such roofs are easily put on, and when lumber is plentiful, they are cheap. They give fair service while they last, and they are not expected to last long. They are often seen on portable sawmills, as in this one. Softwoods are preferred to hardwoods because they are less apt to warp and check in the weather.

act as a preservative against decay. Early voyageurs and trappers about the sources of the Mississippi and northward in Canada floored and roofed their camps with basswood bark when they could get it, and, as related in the interesting journals of Alexander Henry, they often put themselves to much trouble to get this bark.

Man was pretty well advanced in the use of tools before he was able to split tree trunks into boards and use them for roofing purposes. The lowest savage could break boughs for thatch; and only a little more skill was needed for stripping bark; but the step was rather long which placed primitive man in a position for working wood into flat boards for roofing his hut. Little of that work was being done by the aboriginal Americans at the time of the discovery, although they knew how to rive northern white cedar, or arborvitae, and make ribs and braces of it to strengthen their bark canoes. They did this more by beating the wood with stones than by riving it with wedges; but the splitting was made possible by the wood's peculiar texture which caused it to part along the rings of annual growth. Splitting boards for roofs was a much more difficult task and was practically beyond the Indian's ability.

The clapboard for roofing was the white man's invention. No savage gave him any hints along that line, and that was one of the things which the frontiersman did not learn from the natives whom he dispossessed of their forest heritage. Such boards have

been of different sizes and sorts, some sawed, some split, one kind thicker on one edge than on the other. The oldest kind in America was split from bolts with maul, mallet, wedges, and froe, before mills sawed such boards. The clapboard was about three feet long, from five to

ten inches wide, and half an inch or more in thickness.

Such clapboards might be spoken of in the present tense as well as in the past, for they are with us yet; but it is now so much more convenient to make them by machinery than to work them out with wedges, mallets, mauls, and froes, that the handmade article is not often produced now, at least in the larger size. The split clapboards of the pioneers exist in large numbers yet on old buildings which have stood many years. Roofs of that kind are still to be seen in mountainous districts, particularly among the Appalachian ranges, though that peculiar style of roofs in which the boards are held

in place by logs or poles laid upon them, is becoming scarce, even on old buildings coming down from a long time ago. Few have been made in the past fifty years, and decay, fire, and other misfortunes have spared few of these relics.

It is a style of roof that will not be much missed, for it does not belong to our day and generation, but rather to the Daniel Boone state of culture. Modern roofs are better.

The split clapboards were made of sundry woods. Each region used the best it had. Oak was a favorite where it was procurable. It



SHINGLE ROOF 102 YEARS OLD.

The roof on the central part of this barn was of white pine shingles, fastened with home-made nails, and served more than a century, when snow broke it down. The walls still stand on Bethel Farm, near Parsons, West Virginia. The nails were made by a negro slave named Titus Walker.



ORNAMENTAL AS WELL AS USEFUL

The architect who has a predilection for geometrical figures, can produce pleasing combinations with roofs and walls by working them into artistic patterns and color schemes. The modern residence shown in the accompanying cut is a good example. It stands at Riverdale, on-the-Hudson, and is built of southern pine and roofed with cedar shingles.

rived well and gave long service. Such a roof did not decay quickly, and the wind, rain, hail, and snow that beat on it required a long time to wear it out. The oak clapboard was much thicker than the oak shingle, and it did not warp so badly as the thinner shingles after a soaking rain. Chestnut and ash were well liked for split clapboards, while southern cypress, in durability and riving qualities, was near the top of the list of clapboard woods, though it was equalled by California redwood, and for splitting, it was no better than sugar pine, though the pine is less durable.

There was a smaller size of split clapboard, but it seldom went by that name. When of cypress and made in the South, it was called a shingle, and in California it was made principally of sugar pine and was known as a shake. These commodities, the clapboard, the split shingle, and the shake, are going out of use, but thousands of buildings roofed with them are still standing.

Any wood that may be had in bolts of sufficient size may be cut in shingles with saws, but the selection of the wood was different when the work of making was done by hand. A wood which did not rive easily was not suitable for shingles. Before the invention of the shingle saw, with its thin edge and gradually thickening blade, the highly satisfactory woods for shingles numbered scarcely a dozen in the whole United States, though some use was made of others. White pine, southern white cedar, and cypress were the favorite species east of the Rocky Mountains, while sugar pine, redwood, and western red cedar held first place in the far western part of the country. Those named are all soft woods. Where the best softwoods were not procurable, many oak shingles were split and shaved by hand. White oak was preferred, because it was considered more durable than red oak, but both kinds of oak were used in various regions. Oak warps badly

when exposed to alternate wet and dry conditions, as it is on roofs; but though changes in the weather produce curling and twisting in the shingles, oak roofs have sometimes served long periods, as much as forty years in some cases. Roofs of black walnut shingles are never put on now, because too expensive, but formerly they held enviable records for long service, some of those in Virginia having records of seventy-five years of satisfactory use.

Rived and shaved southern white cedar shingles were popular in New York, New Jersey, and Pennsylvania from the earliest settlement of the country until the wood became too scarce to meet the demand. Such roofs were light and durable. An early traveler criticized the builders of houses in Philadelphia because they made the walls only strong enough to sustain the light roof of cedar shingles, making no provision against the time when a new roof would be needed, which would have to be of heavier material after no more of the cedar shingles could be had. William Cobbett, an English traveler who visited this country about a hundred years ago, said that most of the good houses in America were roofed with shingles of this cedar, but he had in mind particularly New Jersey and eastern Pennsylvania. It is said that a pipe organ builder, Gottlieb Mittelburger, who visited Philadelphia more than a hundred and fifty years ago, worked out improvements in the construction of pipe organs by studying the musical sounds produced by rain falling on white cedar roofs.

There has long been a controversy, which remains unsettled, whether shingles

of white pine, white cedar, or southern cypress will last longest on roofs. They all have phenomenal records for long service.

Though the days of handmade shingles are not quite over, few are produced now-a-days. Saws cut the



A MAMMOTH SHINGLE TREE IN THE FOREST

Here is seen the process of felling a cedar giant in the forest of the Snoqualmie Falls Lumber Company, Washington. The notch or undercut indicates the direction in which the tree will fall. Six-sevenths of the shingles used in the United States come from cedars of the species shown in the picture. The tree grows near the coast from Alaska to California, and the forests contain billions of feet.

country's shingles and the industry is concentrated in a few regions which manufacture the bulk of the shingles. The state of Washington meets two-thirds of the whole demand of the United States, while Louisiana, which is the second state in the production of this commodity, furnishes only six per cent of the whole. White pine formerly held a high place in this industry, but this wood is no longer important as shingle timber. Cheaper species

have taken its place, particularly western red cedar which now furnishes from seventy to eighty per cent of the country's shingles. In this industry, western red cedar is of more importance than all other woods combined. Durability and cheapness are the factors which have given it that commanding place. It has taken the trade away from white pine, but the same processes of manufacture are not in use now as in the palmy days of the white pine shingle. The old shingle makers who plied their trade with froe and drawing knife valued white pine above all other woods because of its fine splitting qualities and its soft-

ness. It was not considered orthodox among shavers of white pine shingles to have any sapwood appear on the finished product, and all such was religiously split from the bolts with axes before the man with the froe began to rive the slivers of wood and hand them over to the man with the drawing knife at the shaving horse.

Roofs made of sawed lumber have always been in use in this country, but they have usually been regarded as makeshifts. They are cheaper than shingles and are more quickly put on. Such a roof may be made waterproof, but often it leaks through knot holes, or through cracks due to the seasoning of the wood. If the sawed boards are laid in two courses, or double, the boards do not dry quickly after a rain, and within a few years decay

is likely to soften the wood and permit rainwater to soak through. The roof planks may be laid on in one of three ways: up and down from eaves to comb, parallel with the rafters; or they may be put on parallel with the eaves, each board overlapping the edge of the one next below; or, the boards are laid diagonally. The last method is by most builders considered the best of the three, because the water has two lines of flow. It can follow the grain of the wood, lengthwise with the board, or it may take a direct course toward the eaves; and in neither case is it liable to find its way through where the edges of the boards overlap.



CARRYING A CEDAR LOG THROUGH THE AIR

Here is shown a stage in the work of making shingles. A steam skidder is carrying a log out of the woods and delivering it to the railroad which will convey it to the shingle mill. Nothing is done by hand that machines can do better and more quickly. The scene is near Clear Lake, Washington.

The hardest argument that the advocates of wooden roofs have to meet, relates to the fire peril. That danger is considerable, but it is not quite so great as it has been represented to be by those who argue against the use of shingles. Interests which deal with roofing material other than wood have seen to it that the fire peril has



THE "KNEE BOLTER" DOING HIS WORK

The man operating the shingle machine is called a "knee bolter." With his knee he operates the carriage and rotates the block as it goes against the saw which takes off all the bark and sap. The block is then ready to be passed to the shingle saw. This mill is located at Clear Lake, Washington, in a famous shingle district.

been fully discussed and exploited, so far as it militates against the wooden roof.

The table which follows shows the number of shingles made from the several woods listed. The figures are for 1915:

Wood	Output
Cedar	9,500,908,000
Cypress	1,311,750,000
Yellow pine	578,307,000
Redwood	447,197,000
White pine	68,806,000
Chestnut	45,084,000
Western pine.....	30,308,000
Hemlock	24,140,000
Spruce	8,003,000
All other woods	23,182,000
Total	12,037,908,000

Precautions are necessary if such roofs are to be safeguarded against fire, because wood when dry, and particularly when old and weatherworn, is easily ignited. Yet it must be in actual contact with fire, or subject to excessive heat, before it will kindle; and in spite of many dangers, houses with wooden roofs are not burned much more frequently than are buildings which have other kinds of roofs. The roof is not the only source of danger from fire.

Chemists and engineers have carried out many experiments to find ways of rendering wood immune to fire danger. In certain directions, encouraging success has been attained, though no method of making a wooden

roof absolutely unburnable has yet been discovered. Shingles may be treated with chemicals in a way to greatly lessen their inflammability, and that is now being done on a scale which bids fair to become commercial. The high cost of the treatment is the chief obstacle in the way of larger use of such shingles, but that drawback may be overcome in time.

The strength of wood and its light weight in proportion to its strength serve to excellent advantage in the frames which support roofs. When wood is subjected to stresses of certain kinds, it shows as much strength as iron, if compared on the basis of their respective weights.

Most roofs consist of two parts. The covering of shingles, tile or whatever it may consist of, sheds the rain or snow, and keeps out the sun and wind; but this covering must have supports, and these are as important as any other part of the roof. These supports constitute the second part of the roof. In the simplest form of primitive constructed shelters, the brush, bark, or boards composing the covering were laid from wall to wall without supports of other kinds; but that form is not in use on many buildings of the present day.

Not infrequently the supports of the roof are more expensive than the actual covering. That holds true particularly of large buildings, but between the largest and the smallest there are many styles, each calling for supports of different kinds and sizes.

The rafters, ridgepole, and sheathing are sufficient for



PACKING THE RED CEDAR SHINGLES FOR SHIPMENT

The shingles are packed in bunches, about four bunches to the thousand, for convenience in handling and counting. An expert packer will put up 140 bunches in a day of ten hours, if his hand is true and his eye is quick. Above the packer's head may be seen the sticks and the strap irons for binding the bunches.

the ordinary house, and there is no better material than wood for these. When a little more strength is wanted, without the addition of much weight, kingposts give the desired result. As the size of the structure increases still further, and a larger, heavier roof is required, trusses are introduced. The truss is a sort of bridge which reaches



GOOD AFTER TWENTY-SEVEN YEARS OF SERVICE

These shingles of western red cedar show little signs of decay though they have been on the roof 27 years. A few are loose, but that is the fault of poor nails and not of bad shingles. This affords an excellent example of the necessity of using none but the best nails in putting on a shingle roof. Photograph by the West Coast Lumbermen's Association.

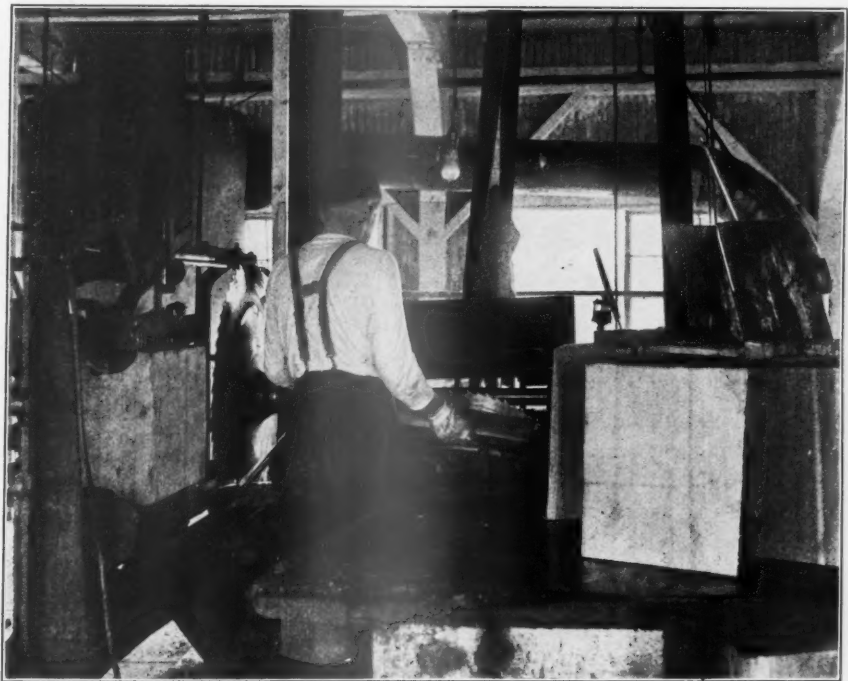
from wall to wall, and its function is not only to support the roof, but also to tie the walls together and prevent them from spreading apart by the push of the weight above. The wooden roof truss has been a favorite study with architects, and they have improved old forms and invented new, until roofs of great size are practicable without posts intermediate between the walls to sustain the load. Walls more than one hundred feet apart may be spanned with safety by trusses, and that style of roof is considered economical under certain conditions. The designers of roof trusses have borrowed ideas from bridge builders, and they have also furnished ideas to bridge builders. A single wooden bridge span, without supporting arches, has been found practicable up to a length of 360 feet or more, and if it were necessary to do so, roofs could be built from wall to wall that far apart by a similar use of wood; but that is not necessary, for it is more economical to have midway posts or columns as supports. But such supports or piers are not always practicable in bridge building, and that accounts for bridge spans being longer than roof trusses.

Steel competes with wood as roof truss material, and this

metal can be used wherever wood answers, provided it is not barred by cost, and if excessive weight is not objectionable. Wood is much lighter than steel, and for trusses of moderate length is cheaper, even when the cost of steel is normal; and at this time, when steel is up in price because of the war, the expense of building wooden trusses, unless they are very large, is far below the cost of steel. But, since the strength of material must be increased in proportion to the length of the truss, a limit in size is finally reached beyond which wood cannot compete with steel, even at the present high cost of the metal.

The building of wood roof trusses for large buildings has greatly increased in this country since the beginning of the European war, when the price of steel rose rapidly. It has surprised many people that wood is so well adapted for that high class of architecture; and the stimulus thus given the use of wood may be expected to have results in years to come.

Investigations of the strength of American woods have given valuable assistance in their use in roof supports as well as in other large structures. It is fortunate that some of the strongest and most abundant woods are moderately light, thus affording maximum strength with minimum weight, making wood an ideal material for large roofs and their supports. Old churches and halls in England have enormous beams as roof supports. Some are larger than the situations called for, but the strong woods of England are quite heavy and the builders wanted to be on the safe side and used large timbers. In America, equal strength is secured by using lighter woods in smaller beams and braces, arranged in a more scientific manner. Among the excellent structural timbers of



PROCESS OF MANUFACTURING RED CEDAR SHINGLES

The shingles are sawed automatically by the machine on the left of the picture. The workman then trues the edges and cuts out the defects on the clipper saw in the center of the picture, and thus makes them ready to be bunched. Photograph by the Clear Lake Lumber Company, Clear Lake, Washington.

American softwoods are longleaf pine, Douglas fir, western larch, hemlock, and spruce. These possess great strength in proportion to their weight, and there are several others which are little, if any, inferior.

Shingle roofs are lighter than those of most other materials which can properly be regarded as competi-

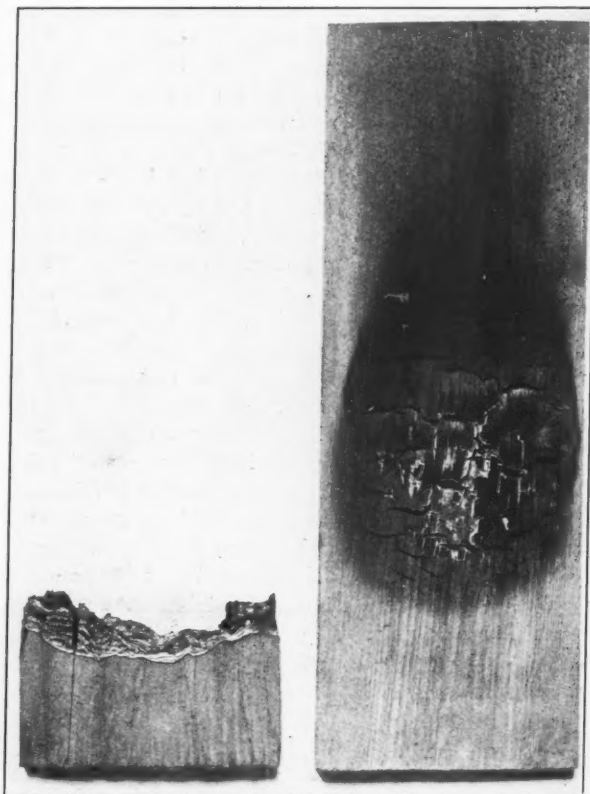
person than it would be if the somewhat cryptic term "modulus of rupture" were employed, and yet precisely the same figures are used.

Wood	Load in pounds
White pine	9,600
Eastern hemlock	9,700
Douglas fir	10,300
Red spruce	10,800
Sitka spruce	11,200
Southern cypress	11,300
Yellow poplar	11,800
Western larch	13,500
Shortleaf pine	13,900
White oak	15,200
Pignut hickory	22,500

The foregoing figures represent seasoned wood. The strength is much less if the woods are tested green. As wood dries, its strength increases.

If the strength were figured out on the basis of or in proportion to the weights of the different woods, the surprising showing would be made that white oak is the weakest wood in the foregoing list, and Sitka spruce the strongest. Weight for weight, that far western wood is stronger than pignut hickory, and that explains why it is preferred for airplanes where the greatest strength and the least weight are demanded. In a lesser degree, the same requirement must be met in roof timbers, and it is apparent that if heavy woods, like oak, were employed in excessive amounts, a point might be reached where the roof would collapse under its own weight.

The nail which fastens the shingle on is often not given due consideration, yet it is as important as the shingle



FIGHTING FIRE BEFORE IT STARTS

Shingles may be rendered partly fireproof by treating them with certain chemicals. Two shingles are shown in the cut. That on the left is untreated, the other is treated, and both were given an equal chance to burn. The photograph is from the U. S. Forest Products Laboratory at Madison, Wisconsin.

tors. The weight per square foot of tile roof is from 12 to 25 pounds; of slate 10 pounds; and of shingles from one to three pounds. If a roof is large, the difference in total weight between a covering of shingles and one of slate or tile is so great that the architect must determine the factors of safety with the utmost caution.

Engineers work out the strength of woods by testing them, and construct tables whereby one wood may be compared with another, all being measured on the same basis. The figures usually given show the "modulus of rupture," which means "measure of the breaking strength." Modulus of rupture is a technical term. The table which follows gives the strength of twelve well known woods, but instead of using the term "modulus of rupture," to express strength, the figures are worked out to show what load in pounds would be required to break a stick approximately two and five-eighth inches square and resting on supports one foot apart. Expressed in that manner, the meaning is clearer to the untechnical



SAWING SHINGLES OF CHESTNUT TIMBER

Shingles of this wood are durable and its use opens the way for utilizing timber of small size killed or likely to be killed by blight, thus saving what otherwise might be wasted. The mill here shown is in Frederick County, Maryland. Photograph by courtesy of the Maryland Board of Forestry.

itself. When the nail rusts through, the shingle is loose and is liable to blow off. There is no economy in buying and laying high grade shingles and fastening them on with low grade nails. First class roofs cannot be made if second class nails are used to fasten the shingles on. The ordinary wire nail may be destroyed by rust in a few years. The zinc-coated nail is recommended, and if



A SAMPLE OF SUGAR PINE SHAKE TIMBER

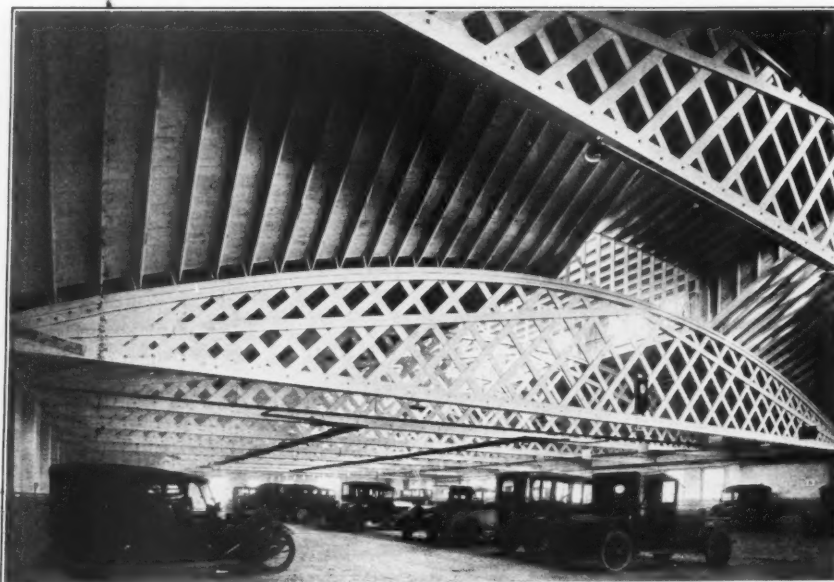
The cut shows a specimen of the splendid sugar pine of California from which the western pioneers rived millions of shakes to roof their shacks and houses. The wood's cleavage is so perfect that shakes were split sufficiently thin to be translucent. The old-time shake is now almost a thing of the past on the Pacific Coast.

a good one is used, it will nearly double the period of service which a roof of good shingles will give.

In a former article of this series, mention was made of a barn in West Virginia whose white pine shingle roof remained in place 102 years and then collapsed under an extraordinary fall of snow. The original nails were still good, and not a shingle had become loose on account of the nails rusting off. So remarkable was this, that the local historian of the neighborhood investigated the origin of the nails,

and by examining old diaries kept by William Parsons, the builder of the barn, it was ascertained that the nails had been hammered from bar iron in the farmer's

blacksmith shop by a negro slave, "during rainy weather." That the work was done during rainy weather probably had nothing to do with the lasting property of the nails; but the fact that wrought iron nails lasted more than a century in the most exposed position imaginable, may contain a hint of value to present day manufacturers of shingle nails.



ROOF TRUSSES REACHING FROM WALL TO WALL

The walls of this building are 120 feet apart and the arched wooden trusses span the space between and sustain the enormous weight of the roof. Such use constitutes a triumph for wood under exacting conditions. This truss is as good as one of steel and much cheaper. Photograph by the National Lumber Manufacturers' Association, Chicago.

BLACK WALNUT FROM THE GUGGENHEIM ESTATE OFFERED TO THE GOVERNMENT

IN offering the black walnut trees on his Port Washington (L. I.) estate to the Government for the manufacture of airplane propellers, says the New York Sun, William Guggenheim has aroused greater interest in the value of those trees for commercial use than perhaps has been done for over half a century. The principal source of the black walnut was in the West and before its popularity waned so many thousands of the walnut trees were cut down that today they are almost as extinct as the American buffalo.

Mr. Guggenheim, who is chairman of the Army and Navy Committee of the American Defense Society, said that he had recently had a census taken of his black walnut trees and discovered that he had about 200.

"My black walnuts vary from one foot to three and a half feet in circumference near the ground," said Mr. Guggenheim. "I believe they were all planted many years ago by former owners. As the tree is slow growing, the largest specimens are probably at least 75 years old. Perhaps only a portion will be available for propellers, but if any of them will be of assistance in aircraft production they will be cut down.

"Before the trees are taken I presume they will be looked over by some one designated by the Aircraft Committee. My idea is to have those selected as available for use sold to manufacturers of airplanes and have the money placed in a fund to be divided by the Red Cross and some other organization."

So far as could be ascertained from landscape architects who are familiar with Long Island estates William Guggenheim's Port Washington place contains the largest number of black walnut trees within a single ownership on Long Island.

G. Douglas Wardrop, editor of *Aerial Age*, in discussing the use of black walnut for airplanes, said that next to mahogany it is doubtless the best wood for propellers, but so little of it is to be had that he doubted whether all the black walnuts on Long Island would be sufficient for more than a few score of propellers.

"You must remember," explained Mr. Wardrop, "that for a satisfactory propeller you want a plank eight feet or more in length and wide enough at the ends to give a 14-inch blade. There are usually five layers of these eight-foot propeller blades, firmly glued together, and oak is being used for some of the inner pieces. I do not think there are many black walnuts in the country that would provide many solid eight-foot planks over 14 inches wide. Mahogany, on account of its strength and solid grain, has always been the favorite wood for airplane propellers and, with few exceptions, is being used for all our best airplanes. We have been getting a very satisfactory supply both from South America and the west coast of Africa, the African mahogany being the better for propeller use. The time is coming, however, when our airplanes will probably be equipped with metal propellers. Germany has used them very successfully."

TUSCANIA SURVIVORS REUNITED ABROAD

THE *American Lumberman* of June 15, published the following interesting story:

"When the ill fated *Tuscania* sailed from the American shore early last February it had on board 800 lads recruited from the woods, sawmills and lumber yards of the country as well as several hundred soldier boys. Most of the boys were fortunate enough to be among the saved, following the 'U' boat attack off the eastern coast of Ireland, and were landed after hours of suffering and mental torture at different points in the Emerald Isle and Scotland. The forestry lads who survived the

southern, in responsible positions, one by one congregated at Morning Hill Camp near Winchester, England.

"Before they departed for France the boys had a group photo taken; an enlargement of it was received this week at the offices of the Long-Bell Lumber Company, in Kansas City. It will be recalled that 164 of the *Tuscania* dead, many of whom were forestry lads, now lie buried near Port Ellen, Islay Island, one of the Hebrides group, but all the Long-Bell boys were among the saved and each one is now doing his 'bit' in France.

"Each one of the Long-Bell boys who are identified in



THESE ARE BOYS OF THE LONG-BELL LUMBER COMPANY WHO WERE ON THE ILL-FATED TUSCANIA

Those appearing in the illustration with their former connections and present assignments with the 20th Engineers are as follows: Standing (from left to right)—J. A. Johnson, Mill at Lake Charles, La., Checker Co. E.—6th Battalion; George B. Oakeson, Assistant Yard Manager at El Dorado, Kan., Sergeant Co. E.—6th Battalion; Max W. Friend, Assistant Yard Manager at Baxter Springs, Kan., Sergeant Major, Headquarters.—6th Battalion; Tom Ashby, Assistant Yard Manager at Augusta, Kan., Corporal Co. E.—6th Battalion; Purl H. Marshall, Yard Manager, Towanda, Kan., Corporal Supply Department Co. E.—6th Battalion; Mr. Rutledge, Mill, Longville, La., Sergeant Co. E.—6th Battalion. Sitting (left to right) William E. Barwick, Sales Office, Chicago, Sergeant Supply Depot Co. F.—6th Battalion; Porter B. Smith, Yard Manager at Leon, Kan., Corporal Supply Depot Co. F.—6th Battalion; Vernon Babcock, Assistant Yard Manager at El Dorado, Kan., Chief Cook, Co. E.—6th Battalion.

Tuscania disaster remained for several weeks at army camps in England before they proceeded to France, and it might be described as one of the pranks of fate that the nine young men who previous to enlisting in the Sixth Battalion of the 20th Engineers (Forest) were employees of the Long-Bell Lumber Company, of Kansas City, Mis-

souri, in responsible positions, one by one congregated at Morning Hill Camp near Winchester, England. Those designated as yard or assistant yard managers previously had mill experience and all were well qualified for engaging in woods and sawmill work in France.

"Since landing safely following the *Tuscania* disaster the Long-Bell boys, like the hundreds of other lumber industry lads who belong to the 20th Engineers, have written home to their relatives and families. These letters have been interesting and descriptive of their experiences, treatment accorded them in Allied countries and matters having to do with their work in France, where they are employed in French forests, doing woods work in their own way, which is *a la* American, or at sawmills now having American machinery and operated along the same lines as sawmills in the United States. Herein, as in many army methods, American brains and American pep are exemplified in the lumber industry lads from the States who have revolutionized lumber produc-

tion in the territories back of the fighting zones. There are many things that the Long-Bell Lumber Company organization is proud of, but of none more than that nine of its former employees are serving for the Allied cause in a way that their experience best fits them, and using their brains and brawn in the task engaged in by hundreds of American lads, of getting out lumber and timber supplies needed by the Allied armies. In modern warfare lumber is just as necessary as guns or munitions or food supplies, and armies to wage war successfully must have their supplies quickly and in quantities.

"The nine boys here shown report themselves as hale and hearty and most enthusiastic in the work that now engages them in France."

A GIRL WHO GUARDS THE FORESTS FROM FIRE

SCATTERED through the vast forests of northern Maine are the numerous watch-towers of the fire-patrol system, where men are on duty with unrelaxing vigilance to detect the first sign of the dreaded forest fires which create such havoc in the valuable timber, if not checked. To be an observer is considered a full-sized man's job. He lives alone, sometimes in the tower itself, sometimes in a little cabin nearby. He is miles and miles from the nearest neighbor. He has a telephone and a part of his duty is to see that the line is kept in working order, a duty which is no small matter as the wire is run almost entirely on trees.

But there is one woman in Maine who is confident that she can do the work as well as a man. She has succeeded in convincing the Forest Commission that she is capable, has been duly appointed, and the first of July began her duties as observer in charge of the station on Mount Kineo, the high bluff which overlooks Moosehead lake. A million dollars' worth of choice timberlands, and more, are in her keeping. This woman is Miss Alice Henderson, of Gardiner, Maine, a self-reliant, bright young woman who says she is twenty-one years old and that she weighs one hundred and thirty pounds, can shoot any kind of a firearm and is not afraid of bears, or much of anything else.

She doesn't mind staying alone nights in the woods on top of a mountain, for while the wild animals of Maine may come around looking for something to eat and be a trifle annoying, they are harmless if let alone. The big, blundering moose sometimes rub their backs against the base of the tower, and timid deer, who are always con-

sumed with curiosity, may wander into the little clearing but they mean no harm. Porcupines are the most annoying for they are not afraid of anything, eat everything they can find and climb upon the cabin roof and rattle and grunt. The black bears are the biggest cowards ever and a shout or shot will send them scampering off at top speed.

As for wicked men—well, Miss Henderson is not afraid of them, that's all. Her duties are to keep a watch in every direction for the first signs of smoke that may mark the start of a devastating forest fire. She has powerful glasses, range-finders and charts and is able to locate the smoke almost to a rod. She can discriminate between the camp fires of a fishing party, or log-driving crew and a fire that's getting away. There are watch-towers all around and information is exchanged over the telephone.

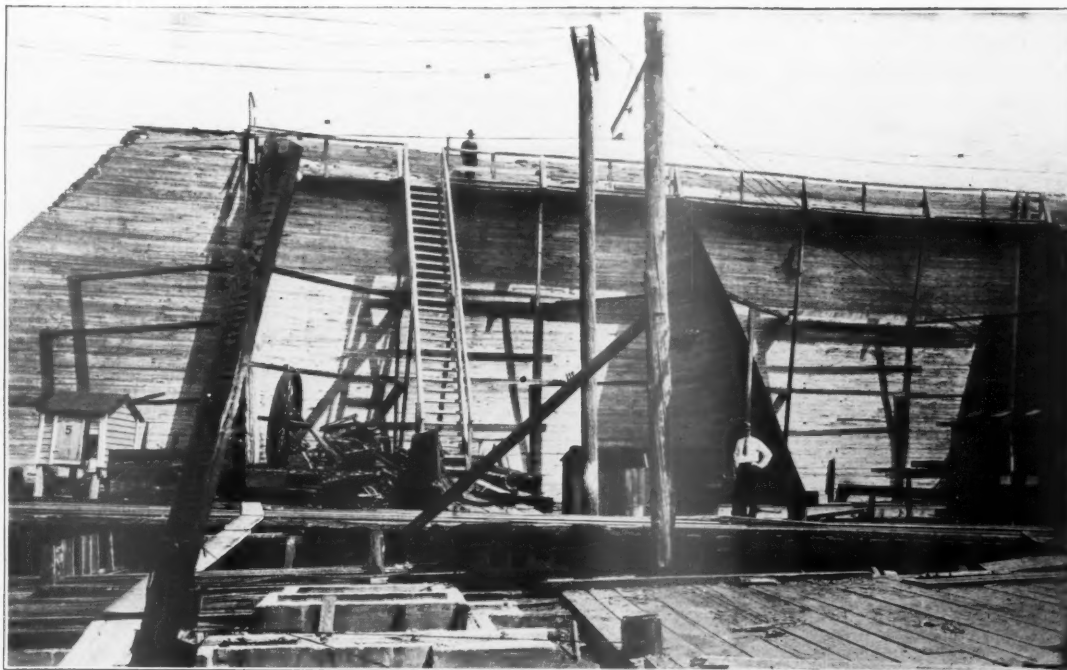
If the smoke grows, the district fire warden is notified at once and he starts with his crew and fire-fighting equipment for the scene. In nine times out of ten he checks the fire at the start. It is estimated that if the warden service and patrols prevent one big forest fire in a season, it saves much more than it costs. The work of the observer

varies from days and days of ceaseless vigilance when the woods are as dry as tinder, to long stretches of rain, fogs and mists when observation is impossible or there is little or no danger of fires.

In these times the observers tend their little garden spots, fix up the telephone lines, do odd jobs or take a long tramp out to the nearest supply camp for provisions. The station of Miss Henderson is the nearest to civilization of any, being but two miles from the Kineo house and settlement.—*The Springfield Republican*.



MISS ALICE HENDERSON
The first Maine woman appointed to forest fire patrol work.



AN excellent example of the fire resisting qualities of an ordinary wooden fire wall was furnished in the fire which destroyed the old plants of the Northwestern Box Company and the West Side Lumber & Shingle Company at Portland, Oregon. The wall is shown above. This wall was all that stood between the fire and the plant of the Portland Lumber Company, one of the largest and most modern mills in the Northwest. While the flames made a clean sweep of the Northwestern and West Side mills the Portland Lumber Company's property was not even scorched.

THE wall is 35 feet high, constructed of 2x6 Douglas Fir planks laid flat on top of one another, and with buttresses on the side toward the Portland plant, to give stability to the wall. It was constructed about 10 years ago. Recently part of it was torn down to make room for a power plant, evidence of which can be seen in pile driver, derrick and steel framing in the foreground.

THE fire raged for three or four hours and, on account of the thoroughly seasoned and oily condition of the timbers of the old mill, was of such intensity that it could not be approached within several hundred feet. Despite this, work on the opposite side of the wall continued without interruption. An examination afterwards revealed that the maximum depth of the charring over the surface of the wall exposed to the fire was less than one inch. Below we see the destruction from the fire, and the other side of the fire wall.



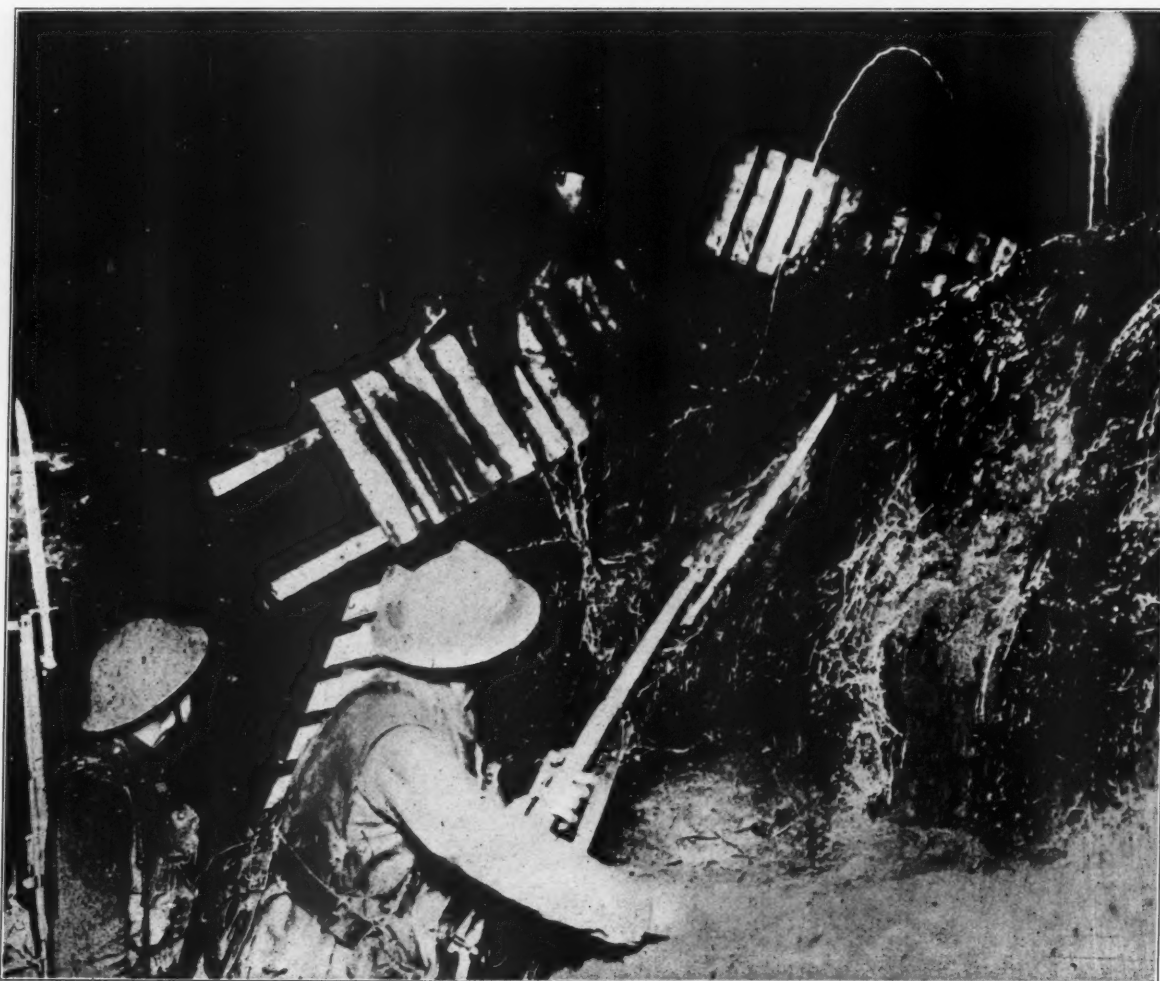
AN ARMY "PARSON" IN FRANCE

WE print a most interesting letter received from Lieut. Howard Y. Williams, the Chaplain of Tenth Engineers, under date of June 10th:

"In the British army he is the 'padre,' but in our American regiment he is the 'parson,' at least that has become my cognomen in the Tenth Engineers, one of the finest groups of men ever assembled. One evening in September last we steamed out of New York harbor with not a soldier to be seen on deck, and very few onlookers aware that one of the first contingents was on its way to France. If our departure was a secret, not so our arrival in Europe. As we wended our way up the Clyde channel, between two endless rows of ships in all stages of construction, we were given as the first American troops to land in Glasgow, such a prolonged reception as we shall never forget. It seemed as though the shipyards had declared a half holiday for the river banks were crowded with the men and women workers who

cheered and cheered. The shout would go out, 'Are you down-hearted?' and like a raging torrent came back the answer of Americans, 'Hell, No!' Some women of Glasgow had cleaned the barracks for our reception, but the R. T. O. had trains waiting and in a few hours we marched to the depot amid shouting thousands. Though on our return to America no one should greet us, we would not be greatly disappointed, for all that we ever shall deserve we received from those Scotch Highlanders.

"These pioneers of American troops in France it has been my privilege to serve as a chaplain. For nine months now they have been working in the forests behind the fighting lines, getting out barb-wire stakes, trench poles, duck-boards, mine timbers, signal corps poles, and lumber of all kinds for dug-outs, barracks, and warehouses. Day and night the men labor sending up their products to the front, often to the tune of the



Underwood and Underwood—British Official Photograph

ONE OF THE REASONS WHY THE WORK OF OUR FORESTER-SOLDIERS IS SO NECESSARY

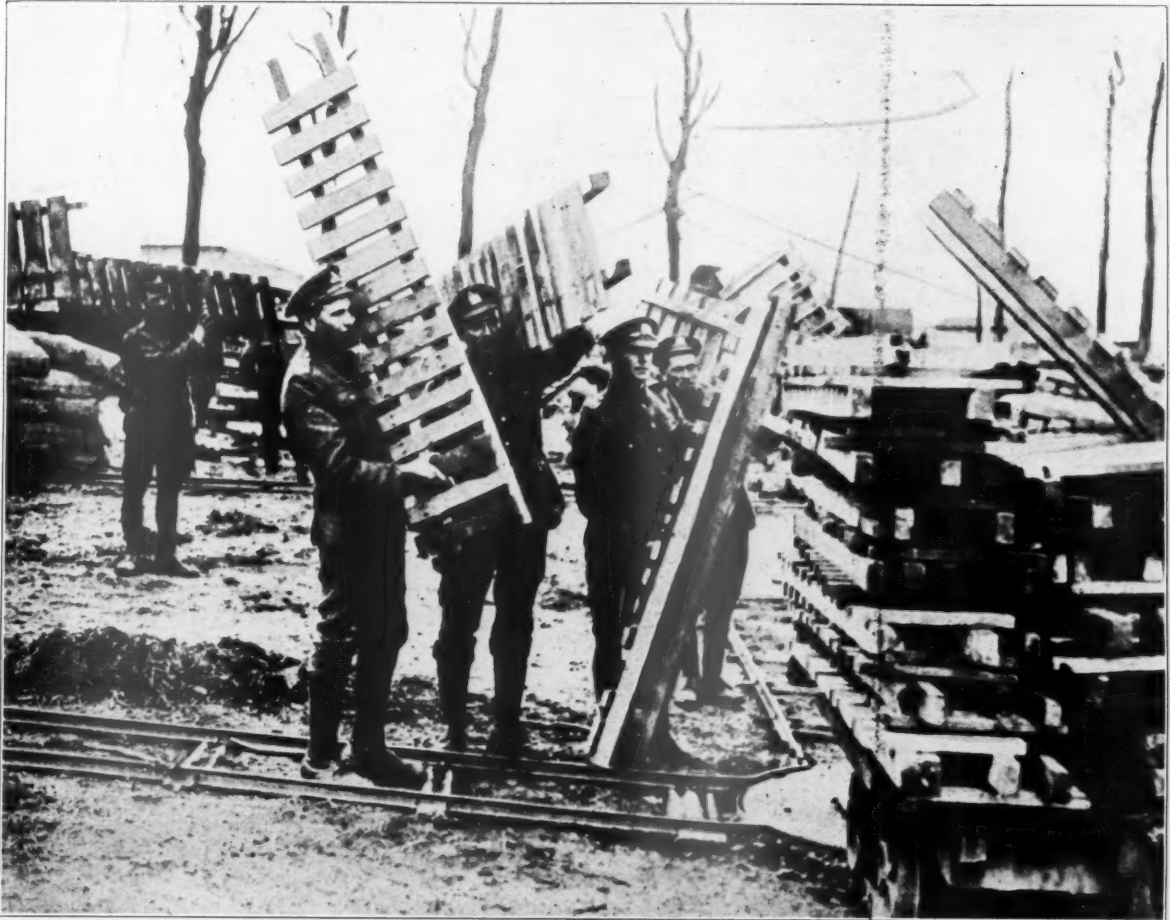
In this most remarkable flashlight photograph, taken in a British trench, we see a working party starting out over the top at night. The soldiers are carrying wooden trench mats to an outpost across No Man's Land. In the upper right hand corner a German flare can be seen bursting, while down in the trench troops with bayonets set are on the alert to cover the men who are going over.

heavy guns roaring away in the distance. About one-third of this regiment are college men, a number of them are well-known athletes, some from wealthy families, but here they are all on one basis. What needs to

be done they do, digging trenches, breaking rock for roads, blasting, even to taking the place of horses. I remember censoring a young soldier's letter during the early days here and he had written, 'I have been a horse for the last three days,' and he had, for before our horses arrived ten or twelve men had been hitched to a wagon hauling necessities to the camp. The work is rather monotonous and has not the excitement of trench life, but the men jump into it with a vim and a smile that makes us all proud of them.

"Such is my congregation of 1600 engineers, augmented by four service battalion companies making about 2500 parishioners in all. The parish is divided into five large posts, scattered over France from east to west, and from north to south. From one camp we can look over into Switzerland and not far from another one into Spain. A western circuit-rider does not compare with an army chaplain as a traveler, for my cir-

cuit takes two months and more. Intensely interesting have been my efforts among these men. Each large post is usually divided into five or six camps some distance apart, and that means that the 'parson' is on the



Underwood and Underwood—British Official Photograph

RUSHING MUCH-NEEDED TRENCH BOARDS TO THE FRONT DURING THE GREAT HUN OFFENSIVE

These duck-boards, called "trench mats" by the Tommies, are a most necessary part of trench equipment, and the demand for them is constant. The lumber and forest regiments are doing splendid work in getting out the timber needed for wooden construction work of all kinds.

jump every day and night. On Sunday I usually hold two and three church services. These have been held in every place imaginable, on a ship's deck, out-of-doors, in half-finished barracks, in old barns, in officer's quarters, in tents, but now mostly in rough recreation halls, or large tents, which we have provided in every camp. Two or three more nights of a week are used to have church services in camps that could not be reached on Sunday. The mid-week services are often preceded by boxing and wrestling bouts, or a baseball game, held out-of-doors. On the remaining nights we have lectures, shows, concerts, moving pictures, in one camp or another. My days are spent in studying, in trips to nearby cities to purchase supplies for canteens and for individual men's needs, in correspondence that shall bring writing paper, athletic equipment, books, magazines, etc.; in personal interviews, visiting the sick, refereeing athletic events and anything that will minister to the well-being of the men.

"How appreciative and responsive these soldiers are. After every service they crowd around to express their gratitude and to discuss and ask questions, but it takes the farewell service when I leave for other posts to truly learn their feeling. After having worked among them for a month and shared their temptations and hardships, their happiness and friendship, it has often been difficult to keep back the tears as I have tried in a final prayer to sum up our gratitude and needs to the Heavenly Father who watches over us and has come very near to us in these days. Traveling among the men in this way I serve to keep the different units of the regiment in touch with one another while we are thus separated, and informed of each other's efforts. Many is the personal greeting I carry from one man to another. I am also the traveling news bureau. On my trips I have the opportunity of seeing the American army progress in all its phases, as well as in getting many personal accounts from the Allied soldiers of the war. Our camps are always near small towns and the news being scarce, no visit of the chaplain is complete without one talk on general observations and experiences. You may well envy the army chaplain his opportunity as preacher, lecturer, educator, athletic promoter, entertainer, buyer, traveler, reporter, regimental historian, but most of all as friend. All one's capacities count, but I think the personal contact perhaps does most. When men have come as individuals in their need and with their difficult problems, then have I had my greatest opportunity, as well as my keenest sense of dependence to Him who is the source of all strength.

"The American army is surely setting a standard here in its care and regard for the men's morals. Our leaders in every way are seeking the highest moral tone. The temptations here are mighty and ever-present, but those in command have co-operated in every way with outside organizations seeking to help our men, and have issued information and orders as would tend to promote

TREES FOR THE HOLY LAND

AN Associated Press dispatch says: "Two principal recommendations which the civilian Commission now in Palestine will make relative to the reconstruction of that country will be a scheme for beginning afforestation, and a proposal for the conservation of water supply by storage and by opening up old springs.

"The greatest of all Palestine's needs is afforestation. For centuries the land has been denuded of its trees, with most disastrous consequences, for the heavy rains at certain seasons, instead of benefitting the soil, over more than four-fifths of the area carry away in rushing torrents much of the little soil that remains on the high lands and valley slopes.

"Palestine has not always been treeless. The Roman Emperors had valuable forests in the country, and Absalom, riding, was caught by the hair among the trees, but today one might gallop from Dan to Beer-sheba without having to duck one's head to avoid a branch."

highest standards. We have plenty of black sheep in our midst as in civil life; some men are falling, but many are climbing upward living stronger and more unselfish lives than in the States. 'Booze' is our greatest enemy. Practically every court-martial case, every difficulty with men in the company administration is due to this evil. It was never so apparent to me what an offender liquor is. This is the verdict of many of our officers and men. Here, again, the army in every way is endeavoring to deal wisely with the situation.

"Most of our regiment are very anxious to get to the front and in the thick of it. Just when our turn shall come we cannot tell, but when it does come we shall be ready to do our part there. In the meantime these engineers plod away at a task which is somewhat monotonous and in the doing of which there is not much glory, but all the same rejoicing to do what their country calls them to do, realizing that the harder they work the more will their brothers at the front have to assist them in their great task.

"The Y. M. C. A. and Red Cross have helped us greatly in camp and hospital, the former having secretaries in three of our camps. Friends of the regiment have made me the treasurer of a Welfare Fund, the money donated to be used in any way for the pleasure and contentment of the soldiers. Thus in every way those with the spirit of the Master of men are making our lives here more happy and useful. All working and fighting together we shall soon have the forces that are incarnated in the Kaiser on the run, victory will be ours, and then the old red flag of war will come down and the white flag of peace shall go up. When that day comes it will be a grand and glorious feeling when General Pershing marches down the line of the victorious hosts and says, 'Army dismissed!' Until that day can come in honor you just watch these men here in France, representing the best land in all the world, giving everything they have to make the world safe."

A LETTER FROM THE FRONT

FROM Mr. Frank A. Cutting, a prominent lumberman of Boston, and one of our members, we have received the following letter. His boy is with the 20th Engineers and the letter shows that his contingent has been in action since the 4th of June.

SOMEWHERE IN FRANCE,
June 7, 1918.

Dear Father:

Would have written before, but these are busy times, and when I have had the time had nothing to write with. We have been in the drive for the last three days went in about 10 o'clock Tuesday night, and have been right on the job ever since, and have made quite an advance and we are holding our line at all points. It looks as if the whole German front will have to drop back.

We have had about every kind of an attack that there is, but have not lost a man from my command. I lost both of my horses, one was gassed, and the other shot. The gas is very bad, as it goes right through the clothing, causing trouble, which often results in death. Now that we are getting an army over here, I look to see a big drive, and then the Germans will find out what war really is.

Am well, and send love to all.
Lieut. Spencer A. Cutting,
Co. A, 9th Bn., 20th Engineers,
U. S. M. P. O. 731, France.

SPENCER.

MIDSUMMER FLOWER-HUNTS

BY R. W. SHUFELDT, M. D., R. A. O. U., ETC.

MAJOR, MEDICAL CORPS, U. S. ARMY, MEMBER OF THE ANTHROPOLOGICAL SOCIETY OF FLORENCE, ITALY, ETC.

IT matters little where we hunt for wild flowers in the open; in fact, no city is so big but what it has its environs—and beyond. Where the essential part comes in is where the searcher possesses the eyes to see the flowers when they are to be seen. Often little grassy courtyards, fifteen by fifteen feet, are veritable "nature gardens," where a sufficient number of wild flower specimens are growing to furnish material for an hour's talk on urban botany to a class of grown-ups, or to hold a bunch of kiddies under a spell for an equal length of time. There is a courtyard of that kind, and of just such dimensions, within fifty feet of the table upon which this article is being written, of exactly the sort I have in mind. Here it is in the month of August, and this little grassy square, fenced nearly all about with a board fence, overgrown with grape-vine and Virginia creeper, has had blooming in it during the summer some ten or fifteen different kinds of wild flowers. To be sure, some of these have been introduced, while others have grown up from seeds which have either blown in there, or been dropped by the few birds that occasionally light on the telephone wire passing over it. For the most part the list contains daisies, columbine, chrysogonum, dandelions, showy orchids, wild geranium, two species of clover, yarrow, violets, sorrel, Virginia day-flower, trumpet-vine, deadly nightshade, jack-in-the-pulpit and devil's bit. Doubtless there may be three or four others of the tiny kind, which might be found upon closer search. Now, if this be true of a little city yard, what a wealth of nature-stuff there must—and in fact there really is—within twenty minutes' ride upon any of the outgoing trolley-cars to the city's environs. Of this there is no better example than our

beautiful National Capital—Washington. In fact, Washington offers particularly attractive inducements to those who may be interested in our native wild flowers and animals, and desire to study them in nature. Yes, in nature; for almost anywhere within three miles or less

of Washington one may readily find beautiful plants and trees and shrubs, thriving and blossoming in all of their pristine wildness, just as they did in the days when our great general of the Revolution had his home at Mount Vernon; or earlier yet, long before the invaders from the Old World came hither, when the red-skinned sons of the soil plied their canoes of bark along the banks of the Potomac.

Where protected by masses of rock and miry marshland, certain stretches of these banks, even on the north side of the river, are in no particular different from what they were centuries ago. To say five centuries ago would by no means be a stretch of the imagination; for amorphous rock is tough, and where it stands amidst the less stable banks of a somewhat rapid river, little change is to be looked for along the water line, or where land and water see their definition during the rise and fall of the tides of the ages.

Along the river, almost directly opposite the city, or short distances either above or below, there are

such places in plenty, either along the banks—be they of marsh, meadow or rock—where old Virginia finds its northern boundary, or on the other side where the District and Maryland terminate on the south. Somewhere in the latter locality there is to be found a place where we may still find growing, in all of its native wildness, the wild senna, with its rich yellow flowers, which, in some specimens, come very close to being of a brilliant



ONE OF THE GREATEST FIGURES IN THE BOTANICAL WORLD

Fig. 4—Carolus Linnaeus, of whom this is a portrait, was a world-famous botanist and zoologist. He was about forty-one years old when this painting was made of him.

orange. (Fig. 1.) Indeed, in Miller and Whiting's "Wild Flowers of the North-Eastern States," although they say that the flowers—that is, petals and stamens—are of a "rich, soft yellow," these parts are of an orange in the beautiful frontispiece of senna in that work. What renders these flowers particularly striking are the deep brown, almost black, anthers, which are conspicuously in evidence on the outer ends of the



WILD SENNA, A BEAUTIFUL SPECIMEN OF WHICH IS HERE SHOWN, STILL HAS ITS USES IN MEDICINE.

Fig. 1—*Cassia marilandica* is the scientific name of this herb, and it belongs in the Pulse family (*Leguminosae*); the flowers are bright yellow and very striking.

ten stamens, which latter are of varying lengths. Although a representative of the vast Pulse family, the papilionaceous type of blossom, which is so characteristic of it, is nearly or quite lost here, as will be noticed in the accompanying cut. The petals, however, are five in number; the flowers in loose clusters, and the leaves compound (12-20, broadly lanceolate), smooth and sensitive to the touch, as is the case with some of its relatives. This herb may grow to become at least eight feet high, and is generally found in swampy lands, though sometimes along roadsides and in alluvial soil elsewhere. It ranges over a good part of the country east of the Mississippi, westward to Nebraska.

In *Nature's Garden* we read that, "While leaves of certain African and East Indian species of senna are most valued for their medicinal properties, those of this plant are largely collected in the Middle and Southern States as a substitute. Caterpillars of several sulphur butterflies, which live exclusively on cassia foliage, appear to feel no evil effects from overdoses." (P. 309.) Both pods and leaves are gathered for this purpose, the former being "hairy" according to Creevey, appearing soon after the flowers die down; the latter drop off on very slight provocation.



MANY OF THE PLANTS IN THE FIGWORT FAMILY (*Scrophulariaceae*) ARE INTERESTING AND ODD, BUT NONE MORE SO THAN THE COMMON BETONY, SHOWN IN THIS CUT.

Fig. 2—This species of *Pedicularis* occurs on sloping, shrubby banks in copses and open woods, often associated with spiderwort and the giant chickweed. It rarely attracts much attention as it is not a showy plant.

Up on the hillsides, above where we found the wild senna, may be found a great many different kinds of flowers both before and after the month of August. Among these may occur the very inconspicuous Wood Betony (*Pedicularis canadensis*, Fig. 2). The generic name of this plant is derived from *pediculus*, a louse, and Doctor Gray remarks that it has "no obvious application." This is somewhat surprising, for to the general zoologists it is so evident. Take, for example, the flower-head in Figure 2, next to the shortest one, and compare the same with any good figure of the common head louse (*Pediculus capitis*),—that is, compare it with the head, thorax, and legs, or those parts beyond the abdomen in that insect, and the resemblance is quite striking. A good figure for this purpose is to be found in Dr. L. O. Howard's work *The Insect Book* (Fig. 212, p. 316). To be sure, all flower-heads of the Wood Betony do not offer this resemblance,



HERE WE HAVE ANOTHER BEAUTIFUL SPECIES OF THE FIGWORT FAMILY, THE FAMOUS PURPLE GERARDIA THAT FLOURISHES IN THE OPEN SANDY LANDS FROM MIDDLE MASSACHUSETTS TO FLORIDA, WESTWARD TO THE LAKES, AND SOUTHWARD TO TEXAS.

Fig. 3—This genus was named for John Gerarde, the eminent botanist; and *G. purpurea*, when growing in masses, surely presents a lovely sight. It has very delicate stems and buds.

as will be appreciated by comparing those in Figure 2 of this article.

We often meet with Wood Betony flourishing in patches on the hillsides in various suburban parts of Washington. These patches rarely cover more ground than some ten or fifteen feet square, where our plant may be mixed with some of the shorter grasses or even with other plants. In certain sections of its range it is known as the "beefsteak plant" or "lousewort." Why the first is hard to say, but in the

case of the second we may note that there were people who appreciated the pedicularian resemblance, even though our good old Doctor Gray did not.

In plucking a matured specimen of Wood Betony, one of the first things that strikes you is its hairyness—a character well seen in some parts of the accompanying figure. Then we may note its simple stem, and its dull, dark green, soft-hairy leaves, which are multilobed and somewhat feather-shaped. Many parts of the entire plant may be more or less tinged with dull magenta, or deep pinkish purple. It will be noted in Figure 2 that the rather large flower-heads are terminal, with bract-like leaves below them or even mixed with them. As this head grows during the summer, it lengthens, as here shown in the tallest specimen. The superior lip of the two-lipped flowers is conspicuous; is of a dark purple color, the lower three-lobed one being of a dull greenish yellow. There are four stamens, and bees are the principal agents upon which this plant depends for fertilization. It may occur almost anywhere east of the Mississippi, or even westward to South Dakota.

"Few plants have been accredited with greater virtue," says Mrs. Dana, "than the ancient betony, which a celebrated Roman physician claimed could cure forty-seven different disorders. The Roman proverb, 'Sell your coat and buy betony,' seems to imply that the plant did not flourish so abundantly along the Apian Way as it does by our American roadsides." Her colored figure of this plant has the flowers altogether too yellow. The Italian plant is *Betonica officinalis*, and during the middle ages that species was cultivated in cemeteries, and worn around the neck of a person to protect him or her against certain evil spirits. Those ancient Italians made up their high heal-all into all sorts of pharmaceutical preparations, each one having some special virtue, while the lot stood for the cure of nearly every known disease of the time. There are those who believe that the word "lousewort" arose from the fact

that when sheep happen to eat the plant, which it is fair to believe they often did and doubtless do still, it gave rise to a peculiar skin disease in them, and this was followed by a small louse appearing upon them—hence the name. Possibly this may be true for the name "lousewort;" but it will not account for the scientific name of the genus, which doubtless came about in the way described above.

Another plant found in our Figwort family along with the wood betony is the Purple Gerardia (Fig. 3). To



THE TWO CATERpillars HERE SHOWN ARE OF THE CHERSIS SPHINX MOTH, A WELL-KNOWN SPECIES COMMON THROUGHOUT THE COUNTRY. (*Hyloicus chersis*.)

Fig. 5—Nearly everyone is familiar with the bunches of pale, tan-colored seeds of the Poison Ivy or Poison Oak vine (*Rhus toxicodendron*). They remain on their stems long after the leaves have fallen. We also have in this picture several seeding heads of the Thimble weed.

be sure, superficially they do not appear to be much alike, though each possesses botanical characters which connect them. Purple Gerardia, so called on account of its beautiful, bell-shaped purple flowers, is often found growing in flat, sandy meadows, in patches several feet in width. When the plants are all in bloom, they may be recognized some distance off. Then, too, if there be any doubt,—that is, in the case of this purple species,—just note whether it has any little fine spots inside the corolla; if it has, you may be sure that you are one point nearer the correct diagnosis. This Gerardia is also a plant which, in a broad sense, is a coast-wise species, being found from northern United States to Florida from the Atlantic shores inland for a belt some twenty miles or more wide. To some extent, this gerardia is a parasitic plant, its roots drawing upon those of others below the surface of the ground.

There is an interesting paragraph in Neltje Blanchan's account of the purple gerardia, and it runs thus: "Low-lying meadows gay with gerardias were never seen by that quaint old botanist and surgeon, John

Gerarde, author of the famous 'Herball or General Historie of Plants,' a folio of nearly fourteen hundred pages, published in London toward the close of Queen Elizabeth's reign. He died without knowing how much he was to be honored by Linnæus in giving his name to this charming American genus."

Speaking of Linnæus, to whom reference has been so

frequently made in these articles, perhaps a word about him here would not be altogether out of place. It is, of course, one of the well-known facts in natural history that he was one of the greatest botanists and zoologists that the world has ever seen. Numerous biographies have been published of him as well as portraits, and one of the latter is here reproduced in Figure 4.

Carolus Linnæus, or Karl von Linne, was a Swede by birth, and was born at Rashult, Smaaland, in Sweden, on the 13th day of May, 1707; he died at Upsala on the 10th of January, 1778, or in the 71st year of his age. In botany he founded the "Linnæus System," which is still the one in use, and is ever likely to be, as it is based on the sexual parts in plant structure. He named thousands of species, genera, and families, and some other groups in biology and botany, and the majority stand to the present day. Numerous forms have been named for him, not to mention one of the craters in the moon (Linne). In 1732 he journeyed to Lapland, and three years thereafter took up his residence in the Netherlands (1735-38). He held several distinguished positions as a teacher in Upsala afterwards, and published a number of very formal and still standard works in botany and zoology, especially the "Systema naturæ." Although his life was not an especially long one, it was filled with most interesting incidents and experiences.

In our rambles we often meet with very beautiful caterpillars of moths and butterflies, and two exquisite pale green ones are shown in Figure 5. It is a most interesting study to collect, properly care for, and feed these various forms of caterpillars, until they pass into the pupa stage, some of them being naked, while others spin a cocoon for themselves, as do the *Cecropia*, which was recently figured in one of these articles in AMERICAN FORESTRY (June, 1918). All such studies are most interesting, not to say important.

Growing in the same field with our *Gerardia*, we may sometimes find little colonies of Pink Sabbatia, a very showy and most attractive plant. It may be recognized

by its sharp, square stem and abundant branching. (Fig. 6.) There is no mistaking its light crimson-pink flowers with their faint fragrance. Another character by which we may know them is the star in the center of each flower, which is of greenish-yellow color. The pale green leaves of our Sabbatia are distinctly five-ribbed, and usually more or less sessile. Other names are given to this striking plant, as Rosy Centaury, Square-stemmed Sabbatia, Rose-Pink, and Bitter-bloom, and during the first part of August is the time to be on the look-out for it, the finest specimens being found near the water. In

some localities it is still prized for its medicinal properties, and in this country it has some beautiful relatives of the same genus, as the Rose of Plymouth, also known as the Marsh or Sea Pink (*S. stellaris*), and others.

One of the wonderful places of the suburbs of Washington is its very extensive zoological park, composed of several hundred acres. People are not allowed to pick flowers there, though it may be said that there are but very few to pick or to study, as we pass through its various well kept sections and its wonderful game paddocks. These latter often appear, in some places, more or less like the true wilds, especially if the heavy timber has been left in the enclosed area. In Figure 7 for example, we see a small part of the extensive elk paddocks, and these noble animals live there summer and winter, much as they did in the Medicine Bow Range back in the 70's.

There are many kinds of interesting flowers in the marsh-lands in this part of the country, or even along the old Georgetown Canal.

Here, on some scorchingly hot day in mid-August, we may meet with great masses of that most curious plant growth generally referred to as Strangle-weed or Dodder. As a plant parasite it has no equal. The historians who write books for nature-lovers have vied with each other in picturing the peculiarities of this marvelous criminal of the plant world in this section of the country. "Starting out in life," says Neltje Blanchan, "with apparently the best intentions,



PINK SABBATIA (*Sabbatia angularis*) IS ONE OF THE MOST SHOWY FLOWERS OF THE GENTIAN FAMILY, OF WHICH THERE ARE MANY SPECIES IN THE UNITED STATES.

Fig. 6—This is a fine specimen collected near Washington, District of Columbia, where it is not very common.

suddenly the tender young twiner develops an appetite for strong drink and murder combined, such as would terrify any budding criminal in Five Points or Seven Dials!" The same gifted writer truly says, in *Nature's Garden*, that "Like tangled yellow yarn wound spirally about the herbage and shrubbery in moist thickets, the dodder grows, its beautiful bright threads plentifully studded with small flowers tightly bunched. Try to loosen its hold on the support it is climbing up, and the secret of its guilt is out at once; for no honest vine is this, but a parasite, a degenerate of the lowest type, with numerous sharp suckers (haustoria) penetrating the back of its victim, and spreading in the softer tissues beneath to steal all their nourishment. So firmly are these suckers attached, that the golden thread-like stem will break before they can be torn from their hold" (p. 247).

An excellent picture of this plant is here shown in Figure 8, being a specimen collected on the banks of

Speaking of sunflowers, it may be said that there are several beautiful species of them in this region, the Jerusalem Artichoke being one of the handsomest and most conspicuous. (Fig. 9.) Its brilliant orange-colored rays generally number from ten to twenty, as shown in the illustration, where one flower has ten and the other thirteen rays. This species is very abundant in the environs of Washington—in fact, it ranges from northern New England southward to Georgia and westward to Nebraska. Generally it is found growing in more or less extensive patches in low, wet places along sluggish creeks and streams or along canals, and on the skirts of marshy woods with many other flowers, where Bind-weed, Joe-pye weed, and the like flourish in abundance.

This species of sunflower has a long and interesting history, being known under a number of vernacular names, as the Canada Potato, the Girasole, and the Earth-apple. Country people generally call it the Sunflower,



ALMOST AS GOOD AS THEIR NATURAL HABITAT

Fig. 7—This is a small part of the elk paddock in the National Zoological Park, at Washington. Some parts of that wonderful reservation appear much like the pristine forests.

the Georgetown canal. There is another strange thing about Dodder: it no sooner fastens onto its victim than its own roots wither away, and it depends entirely upon the sap of its victim for support and nourishment. Sunflowers and Jewel-weed that also flourish in these marshy localities, are often destroyed in great numbers by this voracious sap-sucker, the intimate structure and physiology of which would easily furnish material for a long chapter. It has no leaves as have all self-respecting plants; those seen in Figure 8 belong to its victim—in this case a sunflower.

and we not infrequently find it growing in gardens. Long, long ago it was considered a valuable food—in fact, it was one of the staples of the early native Indians of Virginia. From America it was carried to Europe and cultivated especially by the Italians, who knew it as the Girasole. This is an entirely different plant from the true artichoke (*Cynara scolymus*), which is indigenous to the south of Europe.

Gray describes more than two dozen different species of sunflowers for central and northwestern United States, and this includes the flower just described above,

which may be easily distinguished by the leaves which are conspicuously 3-ribbed. In the Tall or Giant Sunflower (*H. giganteus*), the leaves are sessile, lance-shaped, and distinctly toothed; they are also rough and firm. Some specimens will be found growing to a height of at least 12 feet or rather more. Our big garden sunflower is



ONE OF THE MOST CURIOUS PLANTS IN THIS COUNTRY IS HERE FIGURED; IT IS KNOWN AS THE LOVE VINE, AND IT HAS OTHER COMMON NAMES.

Fig. 8—Common Dodder or the Dodder of Gronovius (*Cuscuta gronovii*), also called Strangle-weed and Angel's hair (*Convolvulaceae*), is a typical plant-parasite that sooner or later destroys the life of its victim.

the *H. annuus*, and it has a very interesting history. Domestic fowls and parrots, including all the macaws, are very fond of its seeds, and the plant is cultivated for their production. Sheep and pigs will also feed upon them to advantage, but it would seem that this is only customary on the Continent.

Alice Lounsberry has an interesting account of the common sunflower, a paragraph or two of which runs thus: "According to the mythological tradition of the Greeks, the sunflower is none other than the fair water nymph Clytie, who was transformed into the flower.

When she found that her mad love for Apollo was not returned, she grieved greatly and sat nine days upon the ground, neither eating nor drinking, but watching intently the sun. Her head she turned gradually to follow him as he traveled from east to west. At last her limbs became rooted to the ground, and her face became a sunflower.

"Even today the illusion is prevalent that the sunflower, the emblem of constancy, turns its face to follow the course of the sun.

"In ancient sculpture the sunflower has ever been a favorite decoration, and especially has it been looked upon as sacred in those countries that have worshipped the sun."

Originally, all the species of sunflowers, some sixty in number, were confined to North America; but the first



THE JERUSALEM ARTICHOKE IS ONE OF THE SHOWIEST AND MOST CONSPICUOUS FLOWERS OF MIDSUMMER

Fig. 9—We have many species of sunflowers in the country, and this is a very well-known one in some sections (*Helianthus tuberosus*).

settlers in Canada soon learned from the Indians the many uses of the plant. Food, dyes, fodder, and a textile fabric were all obtained from them, and they were not long in sending them to Europe for cultivation. Through

cultivation, it is said, the Indians before that had already improved on the native species.

In the various localities where we collect the flowers and plants described in this article, we very frequently meet with different species of our most beautiful and thoroughly harmless little snakes. Of all these there is

no group more entitled to our admiration and protection than the Green Snakes of the genera *Liopeltis* and *Cyclophis*, each created to contain a single species, that is, in so far as the herpetology of the eastern United States goes. In *Liopeltis* we have *L. vernalis*, generally known as the Green Snake or Grass Snake; while in *Cyclophis* we have *C. aestivus*, which, in different localities, is known by the vernacular names of Green Whip Snake, the Magnolia Snake, and the Keel-scaled Green Snake—the latter name probably having been coined for it by some writer on snakes. That the dorsal scales of the middle third of its long, slender body and tail are scaled, there is no

doubt, while those of the Grass Snake are perfectly smooth over the entire body. Its form is well shown in Figure 10 of the present article, and it is a truly beautiful reproduction of a photograph from life. The head and

about four inches of the body are standing out in the clear without any support whatever. The entire creature is of a brilliant grass green, with the under parts of a lively yellow. Specimens may be met with nearly a yard long, and they occur from the southern part of New Jersey, southward, throughout the Atlantic States, and west-

ward to the Mississippi in the northern section of its range, and to the Pacific in the southern. Occasionally it is met with in northern Mexico. It has several specific relatives of the same genus in some parts of Asia. Our form feeds on common black crickets, small grasshoppers, and on other insects. In captivity it has been known to eat mealworms, and it is a very gentle little pet. Generally it is found in low bushes and shrubs—in fact, it is distinctly an arboreal species. Its color is a great protection to it; several individuals may be in a leafy bush and escape the observation of one looking for a specimen. When gliding along on the ground, it will keep its motionless tongue rigidly protruding



A REMARKABLE PHOTOGRAPH OF ONE OF OUR MOST FAMILIAR AND USEFUL SNAKES
Fig. 10.—The little Green Summer Snake (*Liopeltis vernalis*) is one of the prettiest and gentlest creatures we have in our entire fauna; it destroys many noxious insects, and should be thoroughly protected on that account.

from its mouth, with its distal bifurcations drawn together in a single point. This character is easily detected, for the organ is of deep cream color, causing it to be more or less conspicuous as contrasted with the green body.

Our Grass Snake (*L. vernalis*), like its congener, is wholly insectivorous in its diet, and apparently never partakes of animal food in nature. Sometimes, however, it will eat small spiders and caterpillars, provided the latter are of the hairless varieties. Raymond Ditmars, in his most valuable and interesting volume, *The Reptile Book*, says of this genus: "The majority of Green Snakes are the most gentle of serpents and will submit to the most vigorous handling, even when freshly captured, without showing the least sign of anger. Of several hundred specimens the writer failed to note an attempt to bite, except in the case of a single specimen from Long Island. It is interesting to explain that this specimen was very dark olive in color, and in decided contrast to the rich green of the greater number of specimens. It would bite repeatedly at the finger, but the minute teeth failed to produce even a scratch.

"A more innocent and more dainty reptile cannot be

imagined than one of these creatures, and the spectacle of a tiny green serpent beaten to death on the roadside should provoke pity for the human individual who so 'bravely' engaged in combat and succeeded in destroying, with the aid of a substantial club, about twelve or fourteen inches of diminutive body that would have real difficulty in battling with a fair-sized grasshopper" (p. 325).

The enormous, and for the most part invisible army of these gentle little snakes in nature, in the Atlantic States, doubtless number a million or two of specimens—possibly more. This great host consumes annually many tons of grasshoppers; this fact alone should be sufficient, were it generally known, to deter thoughtless country boys—many of whom are sons of farmers—from crushing to death this very useful and entirely harmless little snake whenever and wherever they chance to come across it.

KAISER BOUGHT WALNUT FOR WAR TEN YEARS AGO

THAT this valuable wood for gunstocks was purchased in large quantities by agents of the German Government years ago is brought out in an article in the *Philadelphia Record*. We quote:

"In his efforts to locate available walnut timber for use for the Government in the manufacture of gunstocks. Walter B. Allen, director of military service of the Blair County Branch of the Council of National Defense and Public Safety, has discovered evidence of the war preparation plans of the German Government in years gone by.

"He has ascertained that a great amount of walnut timber was bought by agents of the Kaiser, representations being made that it was intended for use in the manufacture of furniture. The timber was purchased about 10 years ago, and none of those who sold it had the remotest idea of the use to which it was to be put. Few, in fact, knew that they were selling to agents of the German Government.

"When trees were bought they would be felled and left lying on the ground until they could be sawed into pieces suitable for handling. Later they would be hauled to the nearest shipping point and sent away. Several persons have informed Mr. Allen that they learned that the timber was sent to Eastern seaports and shipped to Germany.

"Great quantities of walnut must have been purchased according to reports received here. H. E. Bodine, manager of the Altoona Chamber of Commerce, whose home is in Tioga county, recalls the German agents' activities in that county, and Attorney J. Banks Kurtz, chairman of the Blair County Public Safety Committee, when at his old home in Juniata county, was informed of similar purchases of walnut there.

"Evidently there is little walnut left in this region, for Mr. Allen has not yet found any considerable quantity for our own Government."

NEWS PRINT PAPER FROM SAW DUST

NEWSPRINT paper from sawdust is a fact. Not only is the idea being worked out in the United States, but the *London Times* already is using the material. In a recent issue, just received in this country, the *Times* says editorially:

"Sawdust is a by-product produced in Britain. It takes the place of wood pulp, the importation of which is greatly reduced owing to government restriction. Sawdust paper is manufactured by the Donside Paper Mills, Aberdeen, where experiments have been in progress for a considerable time and are still being carried on in the hope of effecting further improvements."

The importance of the new process to the newspaper business cannot be overestimated. Sawdust news print paper, if entirely successful, means alleviation of the threatened famine. The war, as is generally known, had forced news print paper to new high rates, and actually has resulted in scores of small newspapers being forced out of business, either because of inability to buy enough paper for their needs, or inability to pay the prices demanded by paper makers.

GIFT OF ROAD TO DELAWARE

A ROAD 200 feet wide and extending from one end of Delaware to the other, forming a part of the Lincoln Highway, has been presented to the State by E. C. DuPont. The necessary right-of-way has been purchased by Mr. DuPont and deeded to the State. The roadbed is of cement. Some 40 miles of the southern end of the road have been completed and opened to travel.

The State Board of Agriculture is to be entrusted with the upkeep and control of the road. The necessary funds have likewise been provided by Mr. DuPont. A plan for the improvement and development from a scenic standpoint of the woodlands, forests, and open lands along the DuPont Road has been prepared by Mr. G. B. Sudworth of the Forest Service.

UPLAND GAME BIRDS: THE GROUSE

Family Tetraonidae

BY A. A. ALLEN, PH.D.

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THERE are many ways in which birds serve man, but none has been recognized for so long as that of food and sport. Ever since man descended from the trees and began throwing stones, the flesh of birds has formed an important item in his food supply. With the coming of agriculture and the domestication of animals, birds became even more useful and today millions of dollars are spent each year in raising domesticated birds so that man can vary his diet of beef and pork and mutton. The strangest part of it is that so few birds have entered into the economy of man. All of our domestic ducks, with the exception of the muscovy, have come from the mallard; all of our breeds of pigeons from the rock dove; all of our turkeys from the Mexican turkey and all of our breeds of chickens from the red jungle fowl of India. Other closely related species, to our eyes apparently the same birds, have given us nothing. It is one of the ways of Nature to select one species for glorification. Why should the species homo have risen so far above all the species of apes, and the red jungle fowl so far above the gray or the green?

Mother Nature is a great specialist. Every organism develops, and becomes specialized or adapted for some particular function. Some organisms are constructionists and others are destructionists, and always the two are balanced. The plants are the builders and the animals are the destroyers. And lest some of the destroyers become too numerous, other animals are the destroyers of them. In the course of ages, this is the only way in which life can exist. Otherwise there would be no progress and each

organism by its own growth and multiplication would starve itself and all others into non-existence.

In this scheme of Nature, there is one group of birds which seems to be designed to be the legitimate prey of the larger carnivorous birds and animals including man.

This is the group of game birds. Their habits are such

as to develop the greatest bulk of meat for their size and their food is such as to give to it a tenderness and flavor highly desired. Their food habits are not such as to make them needed in fighting the insects, their colors are usually dull and songs, they have not. Indeed their greatest charm is in their wildness and the subconscious knowledge that they are prized as food. Some of these game birds frequent the lakes and marshes, others the upland woods and fields. The latter include all of the fowl-like or gallinaceous birds of which this paper will treat of the grouse.

Some authorities place all of the gallinaceous birds, the turkeys, grouse, partridges, quail, guinea fowls, pheasants and peafowls, in one family, the Phasianidae, but here in America, we are accustomed to put each group in a family by itself. Thus we have the Tetraonide or grouse, the Odontophoridae or New World par-

tridges and bob-whites, the meleagridae or turkeys, etc. There is likewise considerable confusion in the usage of the common names grouse, partridge and quail. These names are applied to quite different birds in different parts of the country and are used interchangeably in others. It would be difficult to convince most hunters that the bob-white is not a quail and that the ruffed grouse is not a partridge, but strictly speaking, the true



Photograph by H. L. Sharp

AS THE GROUSE LEFT IT

Had not one of the eggs been left exposed the photographers would never have found the nest. There are twelve other eggs in a depression beneath the leaves at the foot of the tree.

quails and partridges are all Old World, members of the family *Perdidae*. The New World bob-whites, California quail, etc., belong to a different family, the *Odontophoridae* and should be called New World partridges or New World quail. This takes the name partridge away from all the grouse family to still another family, the *Tetraonidae*. Finally the name pheasant is quite as inappropriate for members of the grouse family as turkey would be for the pheasants, and yet, in some parts



TWO WEEKS OLD

The wing feathers are the first to grow and young grouse can fly when but a week old and scarcely larger than sparrows. This one is crouching in the dead leaves to escape detection.

of the country, the ruffed grouse is called the pheasant. In general, the grouse can be distinguished by having the tarsus or lower leg more or less covered with feathers, in some species the ptarmigan, extending clear to the tips of the toes. The New World partridges and quail have the tarsus bare and without spurs while the pheasants have it bare but with well developed spurs.

There are about twenty-five species in the grouse family, confined to the northern parts of the Northern Hemisphere, two species of ptarmigan being circumpolar and found both in Europe and America. The majority of species, however, are more or less restricted in their range and the individuals are often sedentary and spend their entire lives within the confines of a small woodland, never migrating. During the nesting season they are solitary but afterwards the young stay with the parents and sometimes different families come together about good feeding spots until good-sized coveys are formed. Grouse are ordinarily terrestrial although, when alarmed, they often fly up into the trees and during the winter, they secure a large part of their food from the

buds of trees. They are not shy birds unless hunted continuously, but allow a very close approach, relying upon their protective coloration to escape detection. How complete this is, is shown in the accompanying photograph of a ruffed grouse on its nest. When they do fly, it is with a startling whirl of the wings that is quite disconcerting to the average hunter. Their flight is rapid and direct although they usually follow the arc of a circle and do not fly far. Indeed when flushed several times and driven to the edge of its circumscribed area, a grouse will often double back right over the head of the hunter.

Grouse ordinarily nest on the ground, the woodland species at the foot of a tree or beneath a fallen branch, and lay from nine to eighteen eggs, a provision of nature for maintaining the species against numerous enemies. The young are covered with down when hatched and are able to run about. Their wing feathers are the first to grow and they are able to fly when about a week old though still very small. The male bird does not ordinarily help in their care. Indeed he is usually never seen near the nest or brood until they are full



Photograph by A. D. DuBois

A "FOOL HEN"

The Franklin's grouse is the western representative of the Spruce grouse and both species are called "fool hens" because of their misplaced confidence in man.

grown. The female, however, is very solicitous for the safety of the young and uses every expedient to distract the pursuer, trailing her wings along the ground, as though severely wounded, hissing like a snake, or even flying into the face of the pursuer. The young crouch at the danger call and do not move until once more called by the mother. Since they are always scattered it is a difficult task to find them, so protectively colored are they. The best known of the grouse family are the ruffed

grouse, spruce grouse and heath hen of the East and the dusky or blue grouse, the Franklyn's grouse, the prairie chicken, sharp-tailed grouse and sage grouse of the West. The northern ptarmigan are represented in Colorado by what is locally known as "white quail," a southern form of the white-tailed ptarmigan.

The most generally known and the finest of all the game birds is the ruffed grouse which, in one or another of its forms, is found in wooded districts from Virginia to Alaska. It gets its name from tufts of large black or brown feathers on the sides of the neck which can be lifted and spread until the head is framed as in an Elizabethan ruff. The broad banded tail is always spread when the bird flies and is one of the simplest ways of distinguishing it from a female pheasant or any other of the game birds.

Before they learn the fear of man and the gun, ruffed grouse are tame birds and merely walk out of one's way along the forest trails, but it takes but very little hunting

from the north of large numbers of goshawks and great-horned owls which are forced out of their normal northern homes by the failure of the rabbit supply which in turn is due to a periodic epidemic. Such an invasion of hawks and owls has occurred during the past two winters. Besides this we might point out that May and June during the past two years have been remarkably cold and wet and thus unfavorable for the rearing of



Photograph by G. C. Embury

NATURE'S METHOD OF PRESERVING GAME

The grouse lay from nine to eighteen eggs, providing for the loss due to their numerous enemies.

before they become shy and tax the utmost skill of the hunter. Owing to excessive hunting grouse have become extremely scarce in many localities and during the past few years, their numbers have been very seriously depleted throughout most of their range. The exact cause for this is not known, but a very plausible theory has been advanced by Mr. John Burnham in the January Bulletin of the American Game Protective Association. He points out that there occurs a periodic diminution of the grouse every ten years owing to the invasion



Photograph by H. L. Sharp

JUST OUT

In getting out of the shell the young grouse remove a neat circular bit from the large end of the egg. The tiny egg tooth can be seen on the tip of their bills. Young grouse can run as soon as hatched and follow the mother like little chickens.

young. Indeed in most places, very few birds of the year have been taken by hunters during the past two years and the inroads made by hunters as well as by vermin on the old birds has quickly shown itself. So much so, in fact, that it will probably be necessary to close the season on grouse for a couple of years so that they can recuperate.

The most interesting characteristic of the ruffed grouse is its habit of drumming. The cock bird selects some fallen log to which he returns often for years. Drumming is at its height during the spring, but even after the breeding season on bright days during the fall and winter the old cock may come back to his favorite log. The drumming sound, which begins with a measured thump—thump—thump—and ends with a loud whirring sound, like the muffled sound of a motorcycle engine, is made by the cock beating the air with his wings. Bracing himself on the log with his tail and standing erect, he first strikes his wings together behind his back producing the thump—thump—thump noise of a big drum. Then as his wings vibrate faster and faster, the whirring sound that can sometimes be heard for half a mile, is

produced. Between his drumming performances and while waiting for the female to approach, he struts up and down the log much like a miniature turkey gobbler with tail spread, wings dropped and ruff erected.

The Spruce partridge of the Northeast and the Franklin's grouse of the West are both inhabitants of the moist spruce forests where their dark coloration seems quite in keeping with their surroundings. The males are easily distinguished from the ruffed grouse by the absence of ruffs and by the largely black underparts. The females are much browner than the males, but have black tails with but a narrow band of brown at the tip. Both species are known as "fool hens" because of their misplaced confidence in man. They seem to have absolutely no fear and will barely get out of one's way in the forest and will often allow themselves to be killed with a stick. For this reason although their flesh is delicious, they cannot compare with the ruffed grouse as game birds.

The dusky or blue grouse is found in one or another of its three forms from the mountains of Arizona to Alaska. It is considerably larger than the other grouse, of a nearly uniform bluish slate color, mottled with brown on the wing. When not hunted it is as unsuspicious as the spruce grouse, but like the ruffed grouse it soon learns to evade the hunter and makes a splendid game bird.

The prairie chicken or pinnated grouse, the sharp-tailed grouse and the sage grouse are birds of the open prairie or sage brush country of the West. With the advance of agriculture into their domain, they have been pushed further and further westward and have been exterminated over a large part of their former range. The three birds, while resembling each other superficially, are quite easily distinguished: the prairie chicken by its pencils of elongated feathers on the sides of the neck and square tail, the sharp-tailed grouse by its similar appearance but pointed tail and absence of the pencils and the sage grouse by its large size, pointed tail and the presence of black on the underparts. All three species have interesting courtship performances in the spring which are quite different from those of the ruffed grouse. The prairie chickens, for example, assemble in small companies on knolls or open places on the prairie where the males compete for the females. Large inflatable sacks are distended on the sides of the neck to the size and color of small oranges, the stiff feathers are erected, and a loud booming sound

is produced by expelling the air from the sacks. They then dance about and fight and rush at the females of their choice in order to win their favor.

The eastern form of the prairie chicken, called the heath hen, which was formerly found throughout the wooded districts of Southern New England and the Middle States is now entirely extinct except for a small flock, now rigidly protected, on the island of Martha's Vineyard.

The ptarmigan are unusual grouse which become pure white in winter, their summer plumage being mottled gray and brown like the lichen-covered rocks. They are birds of the Barren Grounds or the mountain tops above timber line and are always associated with snow and glaciers. The only exception to this is the red grouse of Great Britain which lives on the moors. It has the distinction of being the only ptarmigan which does not turn white in winter and is the only species of bird that is confined to the British Islands. The other well-known

European grouse are the black cock, the large capercaillie and the hazel hens.

All of the different species of grouse seem to offer possibilities for domestication and yet, with the possible exception of the European red grouse, none of them has been bred successfully even as a game bird. With the ever growing number of hunters and the depletion of all game, it is becoming more and more important to devise artificial means of increasing the game supply. So far, in this country, the only birds that have been fully successful on the game farms are the ring-necked pheasant and the mallard duck although better results are



Photograph by G. C. Embury

THIS GROUSE IS EASIER TO SEE

They always rely upon their protective coloring, however, and do not flush until nearly stepped upon.

being obtained each year with bob-whites, and some encouragement is offered with the ruffed grouse and a few other species. It is greatly to be hoped that means for rearing the ruffed grouse in captivity will soon be devised so that the depleted covers may be restocked and so that it can be reintroduced into the woodlands from which it has been exterminated. It is to be hoped that other States will follow the lead taken by New York in establishing an experimental game farm where problems such as this can be scientifically approached, for game farming is still in its infancy.

As far as experiments have progressed it seems quite easy to raise grouse from eggs and even to have them lay in captivity in small numbers, but they suffer from apoplexy and will not stand the crowding necessary

to make their breeding on a large scale a success. The captive birds become exceedingly tame, so much so in fact as to make them a nuisance when they are given any liberty.

The work of saving the heath hen has so far been giving complete protection to the survivors on Martha's Vineyard, awaiting a natural increase. This would doubtless be successful were it not for the fires that

occasionally sweep over its breeding grounds greatly decimating its ranks. The few recent experiments of raising them in captivity have thus far been unsuccessful.

The prairie chicken and the sage grouse that are so rapidly disappearing should also be experimented with before too late. It would be a disgrace to let any one of these splendid birds follow the fate of the passenger pigeon.

LIEUT. DOUGLASS WOUNDED

JUST as this magazine goes to press, word has been received that Lieut. C. W. H. Douglass, formerly Associate Editor of *AMERICAN FORESTRY*, of Syracuse, a graduate of the New York State College of Forestry,



LIEUT. C. W. H. DOUGLASS

Attached to the British Expeditionary Forces, Lieut. Douglass, formerly Associate Editor of *American Forestry*, went over the German lines on June 11th, since which time no word has been had of him.

went over the German lines on June 11th, since which time nothing has been heard of him.

Lieut. Douglass, who gallantly enlisted in the Aviation Section for flying work in the earliest period of the war, went through his training in this country, finishing in

England. He was connected with the Royal Flying Corps and assigned to active service with the British Expeditionary Forces. His many friends will feel pride in reading the following letter sent to Lieut. Douglass' father by the Major under whose command he served, under date of June 13:

"I have absolutely no news to give you of your brave son, who was missing on the eleventh of this month. He went out on low patrol in the afternoon and was not seen after crossing the lines. So we may have great hope that, though a prisoner, he is safe. I sincerely hope this will prove the case, as he was the stoutest-hearted, keenest pilot I have ever been privileged to command, and I had recommended him for promotion on joining his own American unit. Please accept my very sincere sympathy and I hope you may soon receive good news of him."

Lieut. Douglass was Associate Editor of this magazine when he enlisted for service, and the American Forestry Association has instituted a close inquiry through the Paris office of the Red Cross, through which it is hoped to receive encouraging information with regard to his present whereabouts and his well being.

Later: Advices just received from the War Department state that Lieut. Douglass was "severely wounded in action June 11th." This is good news for though it indicates that he was badly wounded it is evident that Lieut. Douglass is not missing and that he is not a German prisoner, but is safe within our own lines.—Editor.

AMERICAN TREES FOR JAPAN

THE United States Department of Agriculture has presented to the city of Tokio ten young *Kalmia latifolia* trees, native to North America. Dr. Walter T. Swingle, of the Department, was sent with the trees. Eight of them have been planted in Hibiya park, Tokio, and the others in the horticultural nursery at Shibuya. The tree is an evergreen, attaining a height of five feet, and belongs to the azalea family, although differing from the common plant of that name. It bears very beautiful pink flowers, and takes its name from a Swedish botanist, Peter Kalm, who discovered it during travels in North America in 1750.

CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT, CANADIAN SOCIETY OF FOREST ENGINEERS

(The regular publication of the Canadian Department has been interrupted because Mr. Wilson has been engaged in important work for the imperial Munitions Board in connection with obtaining airplane spruce. He hopes, however, to continue it without interruption in the future.—Editor.)

ONE of the most important steps toward winning the war is the development of the air fighting forces of the Allies, and as the most important material which enters into their construction is spruce wood, it must be procured on a large scale. Here in Canada this work is being carried on very successfully, more than a million feet of western spruce is being shipped monthly. The work is in charge of Major Austin Taylor, under the Imperial Munitions Board, assisted by H. R. MacMillan, formerly Chief Forester of British Columbia. Before the war broke out the Dominion Commission of Conservation had made a thorough survey of the forests of British Columbia and when the need arose this report showed just where to go for the trees and just about what quantities were available. They also had the man who made the report, R. D. Craig, a forester, and they turned him right over to the Imperial Munitions Board for their work. Mr. MacMillan also brought to this work a thorough knowledge of British Columbia's forest resources and an intimate acquaintance with the lumbermen, whose confidence he had gained in his work as Chief Forester. Major Taylor's executive ability, coupled with the technical knowledge and local experience of these foresters has made the work of producing western spruce a great success. We have, therefore, in this work, the results of preparedness and the technical skill of trained foresters.

There is in the present stage of airplane manufacture practically no other section that can supply the factories with the material which they want except the Pacific Coast, and it is of the utmost importance that the present stands should be most carefully cut and protected from fire. The manufacturers, working, as always, along the easiest lines, are practically using only solid beams and parts for the planes, and the long lengths required can be cut only from western stock. This entails quite a lot of waste, and the parts are not as strong as those built up, or laminated from smaller pieces glued together. The manufacturers do not seem to realize that it has taken several hundred years to grow this material and that the supply is not unlimited, and that it may easily be much impaired by forest fires. It cannot be replaced for centuries. There is a lack of co-ordination between the forest and the factory which should be eliminated, the manufacturer should make his plans for constructing airplanes and the designer his plans and specifications, so as to use to the best advantage the material at hand. The lumberman should be instructed as to how the material he supplies will ultimately be used and the sawmill man too. Each of the big trees should be cut up so as to yield the largest

amount of stock and there should not be a particle of waste anywhere along the line. The war may last for several years more and the airplane has come to stay and will play an increasingly large part in the development of our civilization after the war is over. There is no other material known which can take the place of spruce and we should husband our store and should begin to plan for the future. Spruce should be planted in favorable localities and regularly be cultivated for the production of airplane material.

Every precaution should be taken to protect the western spruce stands from fire, logging debris should be cleared up and an efficient patrol maintained to absolutely prevent fires. Production is of prime importance, but nothing should be allowed to endanger the standing trees.

It is reported that a borer has appeared on the south shore of the St. Lawrence River which is doing quite a lot of damage to the spruce. The Quebec Limit Holders Association has asked the Quebec Forest Protective Association to investigate and see what steps can be taken to combat the pest. The Dominion Entomologist is said to have stated that this insect breeds on the logging debris. If this is the case, steps must be taken to dispose of this by fire at the time of logging. It is coming to be realized more and more that we must dispose of our slash to reduce the fire hazard and to insure the health of the standing and growing timber.

The writer has just been making rather an extensive tour of the sawmills of New England and Quebec, and has reports from New Brunswick and Nova Scotia. He has been struck anew with the view point of the saw mills that quantity production is the only end sought. Quality is a very secondary matter. The waste is very large, although steps are being taken at many mills toward closer utilization. The quality of the trees left in the woods is growing poorer and poorer and this makes the output worse. The supplies of soft wood are dwindling rapidly and it is high time that the whole question of our future timber supply should receive careful study and a plan worked out for the future. Mr. Phillip T. Dodge of the International Paper Company is reported in the New York Times as saying: "Most serious is the matter of pulp wood, from which paper is made. The forests of the United States are in great measure exhausted, but in Canada there is a vast supply, largely on Crown Lands. For years this came freely to the United States, being cut under extensive leases, but exportation from the important sections is now prohibited and the mills of this country are placed at a great disadvantage. "If the wood supply for the making of

paper is practically exhausted in the United States how long does anyone think it will take to place Canada in the same position if all the American mills are allowed free access to her supplies? The uses of wood pulp are rapidly increasing, the consumption of paper is not likely to diminish and while Canada has a large supply it is by no means 'vast.'

The study of the cut over pulp wood lands undertaken last year by the Commission of Conservation, at the instance and with the co-operation of the Laurentide Company, Ltd., is being continued this year and the co-operation of the Department of Lands and Forests of the Province of Quebec and of the Riordon Paper Company, Ltd., has been obtained. The final results of this work will show just what the future has in store for us and give a working basis for the intelligent formulation of working plans and proper utilization of pulp wood lands so as to insure a perpetual supply. The whole subject is a matter of practical common sense and sound business judgment. This is demonstrated by the fact that the two most successful paper companies are those which are taking the greatest interest in this investigation, showing that the policy of looking to the future, which has made them successful, will now be applied to their forest properties.

A visit of the members of the Newsprint Association to the nursery and plantation of the Quebec Government and to those of the Laurentide Company is talked of for the second week in August. This is the idea of Mr. Kellog, Secretary of the News Print Service Bureau.

The forest fire situation in Eastern Canada has been most favorable this year. Some small fires set by farmers clearing land in districts where the permit law has not yet been thoroughly understood have occurred, but they have done little damage.

A letter issued by Mr. H. B. Cassidy is a model well worth the study of other railroad officials. This was issued to all section foremen and urged them to co-operate with the forest fire rangers in every possible way and to try and learn from the rangers the best methods of putting out fires, burning brush and other debris.

The formation of a Lumbermen's Association in New Brunswick, which will co-operate with the Crown Lands Department in the handling of the forests of that Province marks a new era in co-operation. This Association will act in an advisory capacity and will ensure harmonious action and a common sense handling of forestry problems.

TREES SURVIVE YEARS OF FIRE

THE orchards in Hebterne Wood are in full foliage, despite the heavy and continuous shelling. Philip Gibbs, in a special dispatch from the front to the *Detroit Journal*, says:

"With some New Zealand officers I went up to three places yesterday and saw how the wood at Hebterne and the orchards are in full foliage again in spite of all the years of shell fire.

"Gommecourt Park and Rossignol Wood are as dead as when I went to them last, with only naked trunks like masts, and not a leaf on any shell-slashed branch. The enemy has been shelling about here very fiercely during the last few days, for several miles on the way the ground was all overgrown with flowering weeds pitted with shell holes.

"Not any square yards of soil in this neighborhood could be called really 'healthy,' and there were some ugly sounds about as German shells burst with terrific long-drawn echoes, but the New Zealanders sat among the shell craters and outside the entrances to their dugouts with no outward sign of uneasiness, cleaning their rifles, writing letters, playing cards, keeping a lookout over the enemy lines or working about their guns and paying no more attention to the ugly noises than if they had been the buzzing of gnats. We made the most of the noise a little later when our guns opened on to the enemy lines beyond Rossignol Wood.

"I stood watching the bombardment with a young gunner observer behind a hummock of earth, while flocks of shells passed over our heads and burst with monstrous many-colored clouds into the long dip of ground just below the wood."

RUSSIA'S ENORMOUS FOREST RESOURCES

THE astonishing statement is made by A. J. Sack that Russia, including Siberia, has 1,125,000,000 acres of timber which is 63 per cent as much as the whole world possesses. This resource is being set aside by Russia economists as a fund to pay the country's debts. The timber must be manufactured and marketed and the work will require years; but while it is being done, the world's markets will be flooded with Russian timber.

The effect on America's business should be considered, observes the *Hardwood Record* in discussing the article. Except oak, it continues, which is generally known in the market as the Japanese oak, it is not probable that much Russian timber will reach the United States; but it will compete with American lumber in other markets, notably those of Western Europe, and perhaps those of Eastern Asia, western South America and the Pacific Islands.

"To that extent," says the *Hardwood Record*, "our lumber business may be hurt

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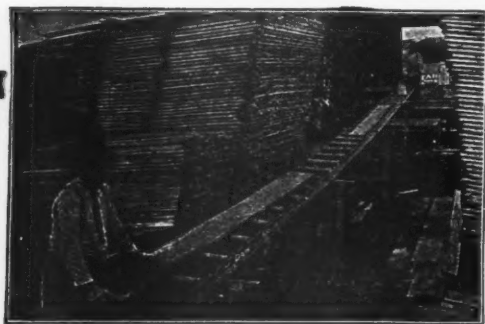
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by the flood of forest products from Russia. In normal times Germany received forty-eight per cent of its lumber imports from Russia, and England's per cent of timber imports from that source was nearly as large.

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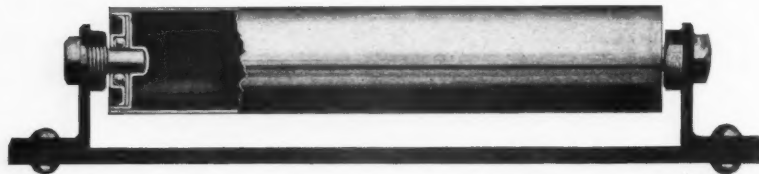
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OLD WOODEN CHURCH TO HOUSE HISTORIC RELICS

"DAVID'S TEMPLE," a church built early last century in York County, Ontario, has been purchased by the York Pioneer and Historical Society to be used as a museum for historic relics. The old church, erected by the late David Wilson, head of a religious sect known as the "Davidites," took six years to build, is entirely of wood and today is in a remarkable state of preservation. The lasting qualities of wood never were better exemplified than in this structure. White Pine in the main was used and the wood today is the admiration of all sightseers.

Many years ago remarkable religious ceremonies were celebrated in the Temple by the "Children of Peace," but for a long period the building has been sadly neglected. Work on the church was started in 1825. It is three stories high, surmounted by a gilded ball on which is inscribed the word "Peace." The church contains nearly 3,000 panes of glass in the windows and spires and has a symbolic meaning attached to all its parts. One feature is an altar that took 365 days to build. It stands on twelve gilded pillars representing the twelve apostles, and is emblematic of the religion of Christ.

The building was intended to be used fifteen times during the year; never at any time for Sunday worship. Services were held on the last Saturday of each month, when the members made contributions for charitable purposes. The first service was held October 29, 1831. The church was painted white with green facings.

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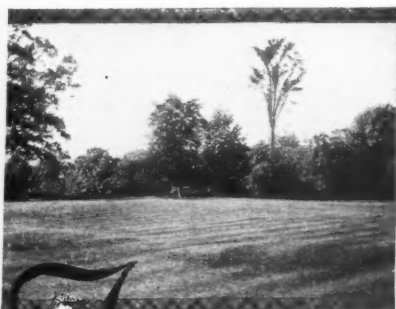
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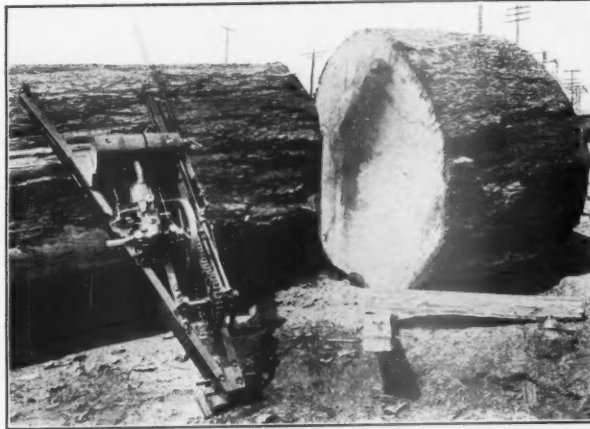
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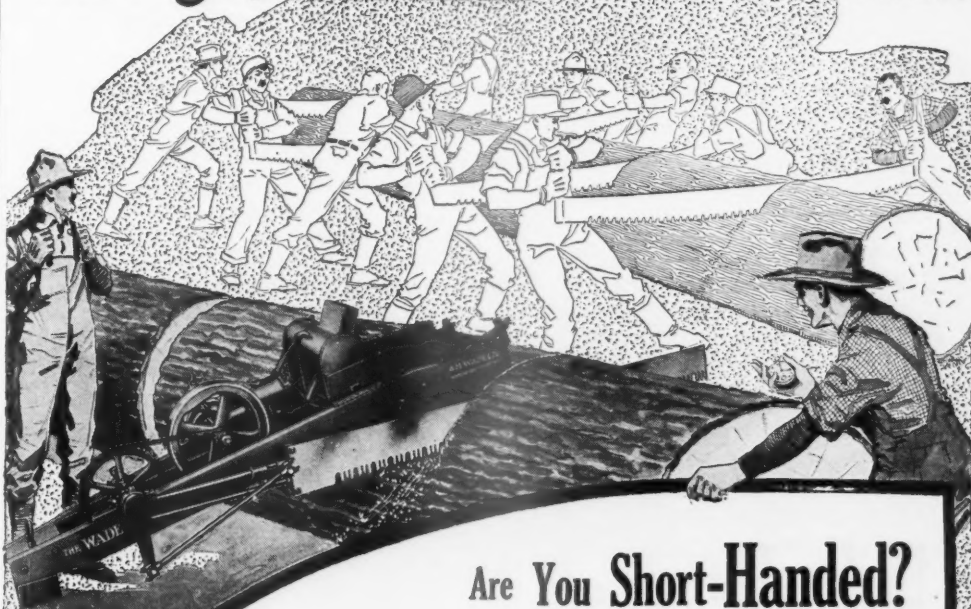
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storage on some tanning materials, by P. Singh, p. 91-100; Wanted: a forest policy for Assam, by A. J. W. Milroy, p. 100-13; Spike disease in sandal, by P. M. Lushington, p. 114-17; Charcoal briquettes, by R. S. Pearson and P. Singh, p. 118-23; Paper-making from *Daphne cannabina* in Garhwal, by M. P. Bhola, p. 125-6; Guiana greenheart, by T. Sington, p. 126-30.

Journal of forestry, May, 1918.—The yield of volunteer second growth as affected by improvement cutting and early weeding, by R. T. Fisher, p. 493-506; Tropical forests and the war, by H. N. Whitford, p. 507-52; The absolute form quotient, by H. Claughton-Wallin, p. 523-34; French fir management in the Vosges; translation, by T. S. Woolsey, Jr., p. 535-49; Comments on Kneipp's paper, "The technical forester in national forest administration," by B. P. Kirkland and others, p. 550-64; Forest management on the national forests, by E. I. Terry, p. 565-6; Forest surveys on the Michigan state forests, by R. Watson, p. 567-75.

Quarterly journal of forestry, Jan., 1918.—Forestry in the Dominion of New Zealand, by W. Schlich, p. 1-28; The seeds of forest trees and their place in British forestry, by W. L. Taylor, p. 28-43.

Quarterly journal of forestry, Apr., 1918.—Forestry before and after the war, by J. C. Archibald, p. 100-17; Japanese larch at Hargham, Norfolk, p. 117-20.

Revue des eaux et forêts, June 1, 1918.—Cabanes a chauves-souris, by A. Jolyet, p. 121-6.

Yale forest school news, July 1, 1918.—Our air fleet in the making, by S. J. Record, p. 35-7; The war wood-fuel campaign, by A. F. Hawes, p. 38; The prospects in Louisiana, by R. D. Forbes, p. 38-9; A timber sale in Dist. 3, by H. H. Chapman, p. 40; War time forestry in the south, by W. R. Mattoon, p. 41; In the maritime pinery, by C. E. Behre, p. 41-2.

BOOKLET ON BRIDGE TIMBERS

The National Lumber Manufacturers' Association recently issued a booklet on Timber Highway Bridges, prepared by C. E. Paul, construction engineer. The booklet discusses the general use of wood in bridge construction, location and substructures, types of framing, floors and wearing surfaces, joints and metal details, quality and kind of lumber used, preservation of bridge timbers and plans of timber highway bridges.

Up to this time there has been a lack of definite data on this subject, although concrete and iron manufacturers had a mass of material available for bridge builders. The booklet can be had on application, free of charge, by addressing the National Lumber Manufacturers' Association, Chicago, Illinois.

LOGGING CONGRESS MEETS IN DECEMBER

The tenth session of the Pacific Logging Congress will be held in Portland during December. The exact dates will be announced later. The reason for the date being later than customary is to permit as large an attendance as possible of logging operators and superintendents. At this season of the year their enjoyment of the Congress proceedings will not be marred by fear of forest fires at the camps during their absence. Then, too, at this period of the year a large number of the pine logging operations have closed down for the winter, thus permitting the attendance of delegates who must necessarily come greater distances than the fir men.

The welfare dinner which has always been a feature of the Congress will be given as usual under the direction of John A. Goodell, of Portland, industrial secretary of the Y. M. C. A.

President W. W. Peed and Secretary George M. Cornwall are preparing a program which they believe will excel all previous efforts. The Congress now has a membership of nearly 300 and continues to grow year by year. The membership list includes operators in British Columbia, Washington, Oregon, California, Idaho and Montana.

HOW TO USE WOODEN SHINGLES

A recent free booklet issued in pamphlet form by the National Lumber Manufacturers' Association, with headquarters in Chicago, is "Why and How Wooden Shingles Should be Used." This booklet was compiled by R. S. Whiting, architectural engineer, and H. H. Isherwood, trade representatives, respectively, of the association. It is devoted principally to the refutation of the idea that wooden shingles are fire-breeds, and any fair-minded person who will weigh the arguments presented will realize that there are "two sides to every story." As a matter of fact, wooden shingles are far superior to any artificial shingle material produced.

PICTURES OF GAME BIRDS

A set of very beautiful pictures, in natural colors, of the game birds of America has recently been issued by the publishers of *The American Shooter Magazine*. They are by Lynn Bogue Hunt, the well-known nature artist. Printed on heavy paper, in natural colors, the pictures are 13 by 14½ inches, and on the back of each is the story about the bird, telling its range, habits, etc. The distribution of these prints is, however, limited to the subscribers to *The American Shooter Magazine*.

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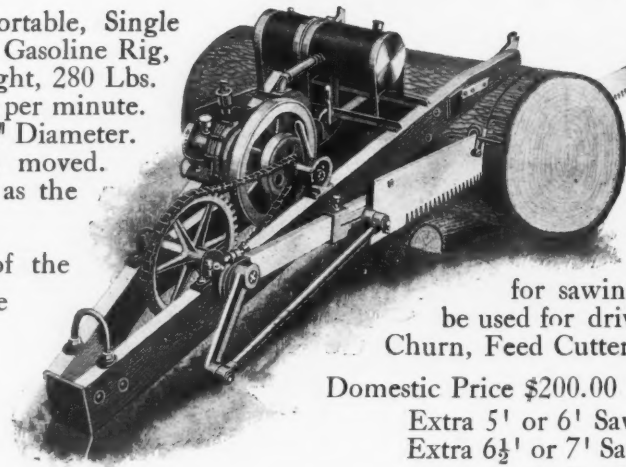
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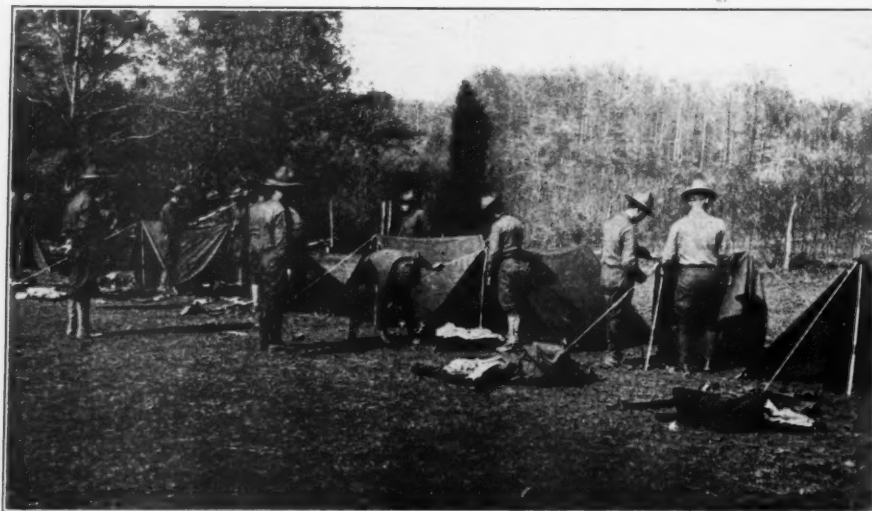
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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumberman in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

In the Cause of Conservation

A

TTENTION OF THE MEMBERS OF THE AMERICAN FORESTRY ASSOCIATION IS DIRECTED TO THE PUBLICATIONS OF THE NATIONAL WAR GARDEN COMMISSION.

T

O ITS BOOKS AND PAMPHLETS ON WAR VEGETABLE GARDENING THERE HAS BEEN ADDED A NEW SERIES OF PUBLICATIONS ON HOME CANNING AND HOME DRYING. ONE OF THESE SHOWS HOW HOME CANNING AND HOME DRYING WILL HELP WIN THE WAR. THE OTHERS SHOW HOW THESE THINGS CAN BE DONE IN EVERY HOUSEHOLD.

B

Y REASON OF CLOSE AFFILIATION, THROUGH ITS CONSERVATION DEPARTMENT, THE AMERICAN FORESTRY ASSOCIATION HAS DIRECT INTEREST IN THE SUCCESSFUL WORK NOW BEING CONDUCTED ON AN INTERNATIONAL SCALE BY THE NATIONAL WAR GARDEN COMMISSION. MEMBERS ARE URGED TO SEE THAT THEIR FRIENDS ARE SUPPLIED WITH SUCH OF THE COMMISSION'S FREE PUBLICATIONS AS CAN BE PUT TO GOOD USE.

Partial List of Publications

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¶ Home Canning and Drying—with instructions for making jellies and fruit butters, and for fermentation, salting and pickling, 32 pp.

¶ Vital Value of the War Garden, 8 pp.

¶ War Gardening by Communities and Neighborhoods.

¶ Canning and the War.

¶ Community and Neighborhood Canning and Drying.

Copies will be Sent upon Request

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